THE BIOLOGIST

A Quarterly Journal Promoting Research Interest in the Biological Sciences

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Twenty-five
Cents

February
1949

Vol. XXXI

Denver, Colorado

No. 3

THE BIOLOGIST

Published in Denver, Colorado, by the Phi Sigma Society, a nonprofit educational organization devoted to the promotion of research interest in the biological sciences, founded at Ohio State University 17 March 1915. THE BIOLOGIST is the official quarterly publication, issued ordinarily on the 15th of August, November, February, and May, as a stimulus to the fellowship in science for which Phi Sigma stands and as a medium of exchange between Chapters.

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RESEARCH AND POLITICS

By Richard B. Goldschmidt
University of California, Berkeley

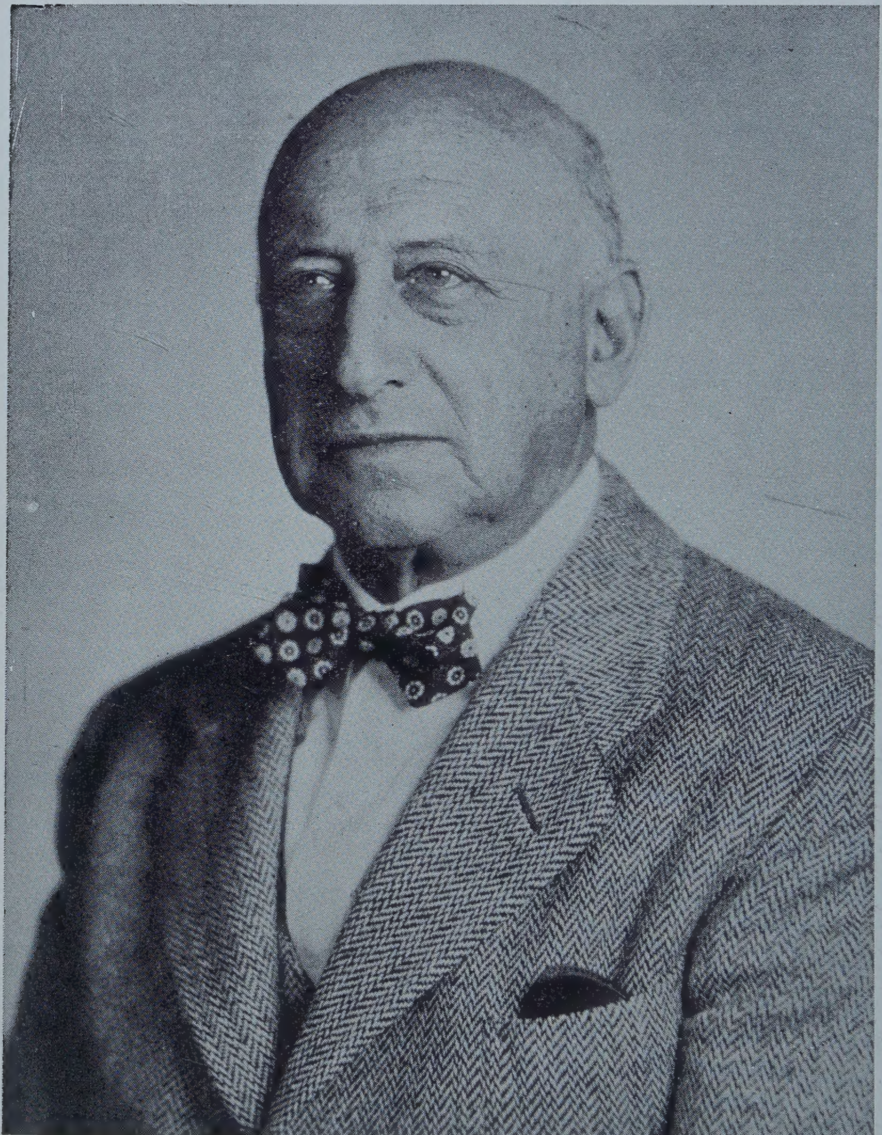
Based upon a presidential address given at a meeting of the Phi Sigma Society held December 30, 1948 at the University of New Mexico.

Research, at least in the sciences, proceeded in the 19th century more or less apart from the nation's life. If the laboratories were not exactly ivory towers, they were at least sheltered oases, far from the noise of the market place. In the European nations scientists particularly were considered a pleasant and honored asset to the community, were respected, sometimes a little ridiculed, but generally left alone. Their discoveries were accepted, sometimes admired, and, if of practical importance, taken over and used by the applied sciences. Nobody asked a scientist why he attacked a special problem. Nobody asked him what practical good could come out of his results. It was accepted as a truism that the exploration of nature, the search for laws beneath the phenomena of nature, grew from a natural longing of the human mind and represented a goal in itself which did not need further justification. This appraisal of science had a corollary, namely, that science, being solely bent upon the discovery of truth, must be free from outside interference by society and the state, although the course goverened by law. When Imperial Germany, a reactionary monarchy, led by the dyed-in-the-wool Junker, Count Bismarck, adopted a new constitution in 1871, a paragraph of this constitution read: "Science and its teachings are free." There were indeed very few instances in the European countries of the 19th century—that is, in the period in which the basis of modern science was laid—of interference with the freedom of science by governments, however reactionary, though there have always been organized groups of different colors who clamored for such interference. This was true even where the universities were completely controlled by government and the professors were civil servants. It happened, to take an example, that under the rule of the Catholic Centrist party in Bavaria, professors were denounced in the Diet for teaching evolution. But they were not prevented from continuing to do so, since even the worst reactionaries did not go so far as to abolish the freedom of teaching.

THE AMERICAN WAY

In our country, conditions were somewhat different. The Constitution does guarantee the freedom of speech, but science and its teaching are not mentioned. There are no federal universities. In endowed universities, only public opinion can prevent the trustees from setting up rules infringing upon the freedom of science. In state universities the regents, the governors, and the assemblies may, if public opinion permits, strangle the freedom of science and its teaching. Everybody knows that such things have happened. There are still states in which the teaching of evolution is forbidden. There are events happening from time to time in this or that university which force the watchdogs of liberty to boycott the offending school. But greatly to the credit of our democracy, these are rare exceptions and as a whole science and its teachings have remained free.

Does this mean that no future danger exists and that we may as well forget the problem of freedom of science? Twenty years ago such complacency would not have been too harmful. But since then the situation has been completely changed. First, we have seen the rise of dictatorships (and unfortunately thus far only two have fallen) —dictatorships which attempt to control not only the minds of their subjects but also to control what science is permitted to do and to think. Do not



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Honorary President-Elect of Phi Sigma
University of California
Berkeley

say this cannot happen here. It *will not* happen, I trust, but it *can* happen. Second, the applications of science to the industrial field, and consequently to national defense have reached a level at which restrictions to science in some fields cannot in the general interest be avoided. This creates the problem of how to take unavoidable measures of caution without infringing upon the basic freedom of science. Third, even in the oldest and most solidly founded democracies an economy has developed which is dependent upon and interlaced with the economies of the entire world. Disappearance of distances has begun to work against traditional individualism and in favor of stronger centralization of power. Whether we like it or not, the trend everywhere is away from individualism and uncontrolled economy toward collectivism. Whether we like it or not, this tendency is bound to increase. Stronger central power means centralized control of the purse strings. This increases the danger of political control of how the money is spent. Where there are federal or state allotments to science, the control will certainly not be in the hands of the scientists. Fourth, events in science have taken place which lead more and more to the introduction of organized teamwork in research. The step from there to planned control and then control by the politicians of science is a very small one indeed. I propose to discuss mainly the first and the last of the four developments I have enumerated.

The experience of science in dictatorships is of greater significance to us than we might think. Even if there is no danger in the near future that similar tragic developments could happen here, it is instructive and important to see the pattern from which such things form and develop. You all know how the Nazis abused the science of genetics to further their criminal racial doctrines and how they made anthropology and eugenics, ethnology, and prehistory and even history in Germany a perversion and abomination. But these are things of the past —are they really?—and therefore I prefer to put in the foreground what is happening today in Soviet biology.

The whole story, part of which I had an opportunity to witness, is very remarkable.

RUSSIAN SCIENCE

Up to the end of the first World War genetics was practically nonexistent in Russia, though Russian biology was on a very high level. It was H. J. Muller who brought the first *Drosophila* stocks to USSR. Calvin F. Bridges soon afterwards served as a professor of genetics in Leningrad. Russian biologists took to the new science with enthusiasm and soon centers of research sprang up in which excellent work was done. In fundamental genetics it was first the zoologist, my late friend Philipchenko, who organized a fine group center in animal and plant genetics and did important work himself. The second great center developed in Moscow where Russia's leading zoologist of that time, the great scholar, observer, experimentalist, and thinker, N. K. Koltzoff (one of my oldest friends), realized the overwhelming importance of the new science and organized genetical and cytological departments in his laboratory of experimental biology. These leaders were followed by a host of excellent men and one has only to look at the volumes of the *Biological Journal* and other Soviet periodicals of the time between 1920 and 1930 to witness the brilliant upsurge of genetical and cytogenetical work in USSR. Parallel with this development went an enthusiastic realization of the importance of genetics for plant and animal breeding. Here the recognized leader was Vavilov. Though originally trained as a geneticist, he never did any outstanding work in fundamental genetics. His interest was in the application of genetical work to plant breeding. Thus, he devoted all his explosive energy to the building of an organization of modern experimental stations all over the country in which genetical and cytogenetical methods were used for the improvement of crop plants. When I visited his laboratory in 1929, he had a staff of about 2,000 employees, and the government furnished ample means for his work. His own line of thought, which earned for him leadership in his field, led to the recognition of the genic reserve available in old cultural varieties and their surviving ancestors. In a continual series of collecting expeditions he searched for such forms and brought them home to test their usefulness. This was work of a long view, and it might have led to important practical results had it been continued long enough. How much in the way of practical results it did achieve is probably known only to the agronomic specialist.

I had the pleasure of seeing all this development of genetics near its height in Russia. At Leningrad in 1929 an all-Russian genetics congress was held at which three guests of honor from abroad were present: Erwin Baur, the plant geneticist, Harry Federley, the cytogeneticist, and myself. All of us, none sympathetic to the political regime in USSR, were unanimous in praising what we saw at this congress. There were innumerable papers and lively discussions. There were huge plenary sessions, with Vavilov and Philipchenko presiding, at which Soviet politicians of the highest rank praised the work of the Russian geneticists. There was a scientific enthusiasm among the old leaders as well as among the brilliant young scientists such as none of the three guests had ever witnessed before. There was an exhibition of genetical specimens and charts which was admirable, quantitatively and qualitatively. Fundamental geneticists at that time were discussing most heatedly Serebrovsky's ideas, and applied geneticists, discussing their wheat-breeding experiments, were equally represented in the very large gathering. Inside and outside the lecture halls the meeting proceeded smoothly and in a most friendly atmosphere.

THE "SALAMANDRA" STORY

This does not mean that the political leaders of the USSR did not watch our science. Actually, I was told that studies in human inheritance were fraught with danger. One leading biologist, who in his search for the hereditary basis of genius studied the pedigree of Russia's most beloved poet, Pushkin, had mentioned correctly that the poet hailed from a family of petty nobility. This biologist got into trouble with the authorities. By chance, I saw a little more of the official attitude. One day walking along the street with my friend Philipchenko, I saw in front of a movie house a large poster of "Salamandra" decorated with pictures of this harmless animal. My surprised question was answered by my friend with an invitation to see the film. This we did, and my friend interpreted the text. To understand the implications of this propaganda film, which was featured all over Russia, we must turn back to European biology in the first decade after the rediscovery of Mendel's laws.

The Lamarckian doctrine of the inheritance of acquired characters had been completely dropped by most biologists since the time of Weismann's piercing analysis. It had hardly any adherents, except in France, where the doctrine lingered on for a long time, and in the science of paleontology. The rise of genetics, the factual basis of which is irreconcilable with the tenets of Lamarckism, had given the coup de grâce to this doctrine.

In the first decade of the century, a young Viennese zoologist, a brilliant speaker, and clever, popular writer, Kammerer, stirred European biology with a long and voluminous series of papers in which he claimed to have found proof for the inheritance of acquired characters. Two sets of his experiments were especially exciting. In one he compared the black viviparous alpine salamander (newt) with the black-and yellow-spotted oviparous salamander of the lowlands. He claimed that by breeding the black one on yellow background and the spotted one on dark background he could transform appearance as well as reproduction from one type to the other . The new induced type was claimed to be hereditary, even to Mendelize if crossed to the original form. The second experiment was done with the midwife toad, the male of which seizes the egg strings laid by the female, winds them around his hindlegs, and carries them about until hatching time. An exception to the rule, this male is devoid of the thick pigmented thumb pads which other frog and toad males need for the standard type of copulation. Kammerer claimed that he could change the mating habits of the midwife toad to those of ordinary toads by breeding them under conditions used for other toads. Such males not only stopped "midwifery" but also developed the thumb pad and, again, this new induced character was said to be inherited and to Mendelize if crossed to the original form.

In the discussion of these claims, statements were found in Kammerer's papers which did not tally. There had not been sufficient time, according to his own records, for the generations he claimed to have bred. The explosion came when an American visitor, Noble, looked at the specimens exhibited in Kammerer's institute and found that the "induced" dark thumb pad was injected with India ink. Soon after this Kammerer, who was said to have become completely despondent, accepted an invitation to live in USSR. Nothing was heard of what he did there except that, soon after, he committed suicide.

Very likely there are few men left who knew Kammerer and who had seen his work in Vienna under his own guidance, so I should like to give you my interpretation of this much-discussed tragedy. I do not believe that Kammerer was an intentional forger. He was a very highstrung, decadent but brilliant man who spent his nights, after a day in the laboratory, composing symphonies. He was originally not a scientist, but what the Germans call an "Aquarianer," an amateur breeder of lower vertebrates. In this field he had an immense skill, and I believe that the data he presented upon the direct action of the environment are largely correct. (Some of them were actually anticipated a long time before in Weismann's laboratory by M. von Chauvin, who made the experiments for just the opposite reason). He then conceived the idea that he could prove the inheritance of acquired characters and became so obsessed with this idea that he "improved" upon his records. I have reason to believe, from what I have seen in his laboratory, that he continued his experiments, which ended by the death of the specimens, by starting again with similar looking animals. His "Aquarianer" mind did not consider this wrong. He simply did not know what an experiment amounted to. In later years he probably became so absorbed with the necessity for proving his claims that he started inventing results or "doctoring" them. Though the actual results of all this amounted to falsification, I am not certain that he realized it and intended it. He probably was a nervous wreck in the end.

ACQUIRED CHARACTERS

Why did the USSR invite Kammerer to take refuge there from "bourgeois persecution"? One of the strange features of the Soviet religion of dialectic materialism is that it postulates the inheritance of acquired characters as a dogma. The biologist is unable to understand this. One of the underlying ideas is probably that the masses are kept down by a bad environment and that therefore a good environment would make them equal to anyone. If this change is inherited, the future lies in inducing this hereditary improvement. But if this were true, it would follow that the old aristocracy, which had lived so long in the good environment, should be genetically supreme. Of course, one notion is as wrong as the other. Why, then, the dogma of the inheritance of acquired characters? Why can the believer in communism not assume that just as much genetic talent is found in the "suppressed masses" as in the "bourgeois" part of the population and that therefore the communist regime should pick out this talent and give it a chance to blossom? I shall never be able to understand why the latter idea should not be just as good communism as the former and why genuine communism needs the dogma of the inheritance of acquired characters.

This leads us back to the film "Salamandra," which turned out to be nothing but a propaganda film for the doctrine of the inheritance of acquired characters. It uses the tragic figure of Kammerer, his salamanders, and mixed up with them, for the story, his midwife toads. The importance attached to the subject is revealed by the facts that none other than the then all-powerful Commissar for Education, the highly cultured and intelligent Lunacharsky, is the author of the film, that his wife plays the leading lady and that Lunacharsky, playing himself, appears in one scene. Leaving out the interwoven love story written to fit the beautiful Mme. Lunacharsky, the plot is this: In a central European University a young biologist (model Kammerer) is working. He is a great friend of the people and endowed with all the qualities of a Communist movie hero. Working with salamanders, he has succeeded in changing their color by action of the environment. One day the supreme glory is achieved; the effect is inherited. The bad man of the play, a priest, learns of this, comes to the conclusion that the discovery will spell an end to the power of the church and the privileged classes, and decides to act. He meets at night in the church (I recognized with surprise that these pictures were taken in the glorious double cathedral of Erfurt in Thuringia) with a young prince of the blood whom he had succeeded in having appointed as assistant to Kammerer. (This is obviously a typical job for a German prince!) Here in the dark sacristy the plot is hatched. The prince (or the priest?) proposes to Kammerer that he announce his glorious discovery at a formal University meeting, and the scientist gladly accepts. During the following night the priest and the prince enter Kammerer's laboratory, to which the prince has the key, since he poses as the scientist's devoted collaborator. They open the jar in which the proof specimen of salamander is kept in alcohol, and inject the specimen with ink. Then follows the scene at the University meeting. All the professors and the president appear in academic robes, the young scientist is introduced and makes a brilliant speech announcing the final proof for the inheritance of acquired characters. When the applause has ended the priest (or was it the assistant? I am quoting entirely from memory) steps up, opens the jar, takes out the salamander, and dips it into a jar of water. All the color runs out of the specimen. An immense uproar starts and Kammerer is ingloriously kicked out of the University as an imposter. Some time later, we see the poor young scholar walking the streets and begging with an experimental monkey which had followed him into misery. He is completely forgotten until one of his former Russian students arrives and tries to call on him. She succeeds in finding him, finally, completely down and out, in a miserable attic. She takes the train at once to Moscow and obtains an interview with Lunacharsky (this is the scene where he appears in person), who gives orders to save the victim of bourgeois persecution. Meanwhile, the character Kammerer has sunk so low that he decides to make an end of it. The very moment he tries to commit suicide, the Russian student returns with Lunacharsky's message and prevents him from taking his life. The last scene shows a train in which Kammerer and the Russian savior are riding east and a large streamer reads "To the land of liberty."

THE RISE OF LYSENKO

A young plant physiologist and agronomist also attended the congress at Leningrand. He was presumably completely ignorant of genetics but he had made a great and well-deserved reputation as an agronomist by the introduction of the method of vernalization which is said to have increased production of crops considerably. His name was Trofim Lysenko—for Russian biology the man of destiny. For some years after 1929 genetics still bloomed in Soviet Russia, especially when H. J. Muller lived there and trained a group of excellent young scientists. But soon rumors began to arise that something strange and untoward was happening in Soviet genetics. The rumors centered around the name of Lysenko. One heard of public debates taking place in which Lysenko attacked genetics as not only scientifically wrong but also not conductive to improvements in agricultural breeding. Simultaneously, he advanced claims of being able to improve plants by environmental action which is at once inherited. Heredity of acquired characters was once again the slogan. Rumors increased that Lysenko's power was in ascendency; they were borne out when Vavilov was prevented from accepting the presidency of the International Genetics Congress in Edinburgh in 1939 and when the expected Russian delegation did not turn up. (I personally think that it was a mistake to elect Vavilov president of that congress. As the honor was clearly intended to back him up in his fight against Lysenko, it appeared to be a political demonstration and as such had just the opposite effect from that intended.)

The first concrete information arrived about 10 years ago when an American monthly, *Science and Society*, published part of the speeches made in the first big debate between Lysenko and the geneticists. These speeches, pro and con, did not impress one favorably. Lysenko's statements of the theories with which he wanted to replace modern genetics sounded like confused nonsense. His antagonists did not come out with clear, simple statements of what is fact and what is interpretation in genetisc. One had the uncomfortable feeling, when reading these reports, that Lysenko's opponents were already frightened and spoke cautiously, making unnecessary concessions. It soon turned out that they had reason to be frightened when Vavilov was deposed and died mysteriously in a concentration camp during the war years, and when all work in plant breeding was taken over by Lysenko. Again one heard from time to time of Lysenko's ascendance, of the honors and titles given to him, among them that of "*Hero of the Soviet State*" and of president of the Lenin Academy of Agriculture. But there were still laboratories of genetics, though one heard that Koltzoff, not long before his death, was forbidden to do genetics work in his institute. Good publications were still appearing in genetics and cytogenetics, and some even reached us by the ordinary mails. During the last three or four years rumors came from Russia that Lysenko's star had passed its zenith and was setting. Then, suddenly last year papers all over the world reported that Lysenko had finally taken over *all* biology in the USSR, that teaching and research in genetics were forbidden, and that all those who opposed Lysenko were deprived of honors, or even jobs, or worse.

Were the rumors of Lysenko's sinking star wrong? A translation of Lysenko's speeches at the decisive meeting has just been published in New York. The complete frankness of Lysenko's statements leaves no doubt about what happened. He quotes a paragraph written by Academician Zhukovsky, stating that the number of theses in genetics is decreasing and that this might be due to fear of what the Lysenkoists may plan. Lysenko counters that the real explanation is that the faculties refuse to accept theses by "geneticists" of the Lysenko school. Simultaneously, he complains that such great Russian scholars as Schmalhausen do not quote him or his worshipped god, the fruit breeder Michurin, in their books. From these and similar statements, it becomes clear that all prominent Russian biologists, geneticists or not, have the same opinion about Lysenko's "discoveries" as we have. He cannot quote in his favor a single living Soviet scientist whose performance is established in the scientific world. The rumor clearly was true that Lysenko's star was sinking in Soviet "science." But the rumor overlooked one thing: that his star was rising among the professional politicians. For both reasons, it seems that he considered the time ripe for action. If he could not win by persuasion, he would win by coup d'état; this he carried out in the best tradition. In his speech he said suavely that nobody is prevented from working in genetics, though he does not think much of this science. Then he allowed his opponents to say what they wanted. (Thus far, I have not seen translations of their futile speeches.) Then he rose for his final remarks. He began mildly by saying that among the question slips handed to him there was one asking whether his ideas had the official stamp of the party. He answered in the affirmative. I should have liked to see the faces of the scientists who heard this completely friendly and mellow statement. Translated into plain English, it would read correctly: "To all whom it may concern: Lysenko, or else!" Thus, he took over Russian biology exactly after the political pattern established in the satellite countries, by bloodless coup d'état, and we know that the "or else" has already begun.

LYSENKO'S PHILOSOPHY

These last speeches give a much better appraisal of Lysenko and what he stands for and what he is now permitted to enforce than do the earlier publications which have been published in English. He appears clearly in his political roles, which have been more important for his success than his biological claims. (As a corollary one should read the almost simultaneous pronouncements of his brain-truster and *advocatus diaboli*, Prezent.) There does not seem to be any doubt that Lysenko, though a clever politician, is honest and that he believes in his queer ideas, believes in them so religiously that he is willing to impose them by the sword. First of all, he is a fundamentalist. Just as the Christian fundamentalist believes in the divine origin and truth of every word of the Bible, so Lysenko believes in every word of his gods, Marx, Lenin, Stalin, and the Russian Burbank, Michurin. He can refute every argument finally by quoting from these sources. He has set up his rules of the scientific game according to what he considers to be the tenets of dialectic materialism. His views are materialistic and therefore good. All others are decreed idealistic and therefore bad. He does not realize that atomistic classic genetics is extremely materialistic, while his own views border on mysticism. Being a fundamentalist, he simply decides what is right and what is wrong, and there is no appeal. There is also no need for him to study what he condemns, because he knows a priori that it is wrong.

Next to being a fundamentalist, Lysenko is an extremely clever lawyer, almost a shyster. It is revealing to read how he sets up first a completely wrong description of Weismann's ideas and then ridicules his version of them; or how he fights pre-Mendelian ideas as the tenets of present day Mendelism; or how he recounts some technicalities which the nongeneticist cannot understand by quoting literally from Dubinin in order to ridicule genetical work in the eyes of the agronomists and politicians; or how he says on one page that chromosomes, Mendelian segregation, etc., are all figments of the imagination and on another page that he has never doubted the facts relating to all these things; or how he seizes (Prezent does this still better) upon mystical utterances of nongeneticists, even of popular writers (Prezent quotes from the popularizer Francé, from Smuts, Bergson, Bertalanffi, for all of whose statements genetics is made responsible), to show up genetics as idealistic, which means to him, criminal.

A third part of Lysenko is his chauvinism. Nothing printed appears without mention of *Soviet* science, *Soviet* Darwinism, progressive *Soviet* scientists. The ignorant reader must believe that what Lysenko does and says is 100-percent Soviet Russian, while all his opponents are traitors, imitators of foreign ideas, even promoters of capitalism and similar crimes. He does not mind attacking a Russian scholar of the pre-Soviet group for his heresies, then setting him up on another page as a Soviet scientist, when he defends that man's priority of a good idea (which Lysenko thinks, however, to be bad). I will not insist here that the incense he burns to Stalin is of a type which one formerly knew only from Nazi writers towards Hitler. This is probably the outflow of his religious fanaticism, though it sounds like repulsive adulation. Lysenko is also an able rabble-rouser. The way he presents Dubinin's work on inversions in populations of *Drosophila* is a masterpiece of this type of oratory.

Fourthly, Lysenko is a very skillful politician who knows very well the rules of the game and how and when to act.

LYSENKOISM IN ACTION

But now let us turn to his so-called work. Not, of course, his early physiological work on vernalization but his recent work which convinced him that he is the Allah and the Mohammed of the new Soviet biology which must supplant bourgeois biology, especially genetics, even by fire and sword where mere persuasion fails. One can probably reconstruct Lysenko's development. Being successful as a plant physiologist in improving crops by changing environmental factors and not being trained in genetics, the official governmental support of heredity of acquired characters easily impressed him and suggested a way of helping the breeders with much simpler methods than those of genetics. He found support in the works of his hero, Michurin, who had successfully produced new varieties of fruit and given his own Lamarckian interpretation. Thus Lysenko set out to develop a Lamarckian theory of heredity and to prove it experimentally. One can consider his biological activities from three aspects: his criticism of the facts and conclusions of genetics, for which he uses the rather silly term Mendelism-Morganism; his own theoretical explanations of heredity; and his alleged proofs of his views.

Lysenko does not think much of genetics and refuses to accept such simple facts as the uniformity of F_1, the numerical rules of segregation, or the chance assortment of chromosomes in meiosis, not to speak of the more advanced facts of genetics. He approvingly quotes Michurin's words that Mendelism ". . . contradicts natural truth in nature, before which no artful structure reared out of wrongly understood phenomena can stand up" and thinks that such mumbo-jumbo settles Mendelism. He also quotes approvingly. Michurin's modest statement that Michurin bequeathes his conclusion "to naturalists of coming centuries and millenniums." (One hears Hitler's voice!) Such elementary facts as the chance assortment of chromosomes Lysenko considers to be mystical nonsense. It is not an overstatement that almost every thing he says about genetics and cytogenetics in his three major translated books and speeches exhibits a complete ignorance of the subject. How it is possible that he has never taken the trouble to see with his own eyes what thousands of students all over the world are unfailingly shown in the laboratory courses in genetics and cytology, year after year? Is this bad will or obscurantism? When I read, for example, that the most important thing for Soviet biologists to do is to read "over again and again" Michurin's works, the only answer I can find is that Lysenko does not want to know the facts which he is attacking because he is a fundamentalist believer, for whom everything is decided in advance. Someone should take the trouble to extract all his statements on modern genetics, so as to have them side by side. The collection would make a stone weep.

Lysenko's second action is the development of his own ideas. Environment is everything and the operation of the environment upon the body changes it permanently. How this comes about is repeatedly stated, e.g. "Heredity is the effect of the concentration of the action of external conditions assimilated by the organism in a series of preceding generations" or on another page, "Heredity is the property of a living body to require definite conditions for its life and development and to respond in a definite way to various conditions"; then, concerning changes in heredity: "Changes in heredity are as a rule a result of the organism's development under external conditions which, to some extent or other, do not correspond to the natural requirements of the given organic form" or "The extent of hereditary transmission of alterations depends on the extent to which the substances of the altered section of the body join in the process which leads to the formation of reproductive sexual or vegetative cells. Once we know how the heredity of an organism is built up, we can change it in a definite direction by creating definite conditions at a definite moment in the development of an organism" and so forth *ad nauseam*.

The same man who produces this mystical and empty phraseology (though it can be called by a more appropriate name) derides modern genetics, with its clear-cut verifiable facts and wonderful parallelism of experimental results with cytological facts, both easily verified by any beginner; he calls modern genetics "idealistic, mystical nonsense," and his braintruster, Prezent, even denounces genetics as made to order for the benefit of the capitalist employers of the geneticists; and, *horrible dictu*, he believes fanatically in this evident nonsense. I repeat that not a single USSR biologist of renown, all of them probably good Communists, is willing to take seriously Lysenko's so-called biology. Lysenko had to pack the Lenin Academy with his cohorts, as he naively states in his last paper, to create an audience for his theories. As for those who do not follow him there is a sinister meaning in a list of errata appended to a German translation of his speeches. It reads: p. 24, first §, instead of ". . . straight lined action of *our Soviet* Cytogeneticist-Morganists" read: "straight lined action of *our homegrown* Cytogeneticists-Morganists" (Italics mine).

Biologists, however, are interested mostly in the facts which Lysenko claims to have found in proof of the inheritance of acquired characters. One should expect Lysenko to put these facts in the foreground of his discussion when he wants to convince his fellow geneticists. Actually, reports on facts play a rather modest role in his accessible writings, and they are always presented in a vague, elusive way. In his decisive discussion of his views, just before he staged his *coup d'état*, he tells us rather vaguely, as before, that he can change hereditary winter grain rapidly and at will into hereditary summer grain simply by changing the time of planting. He must certainly be aware that no one will believe this story unless it can be shown that his experiments have been made with all the precautions, controls, and checks which a knowledge of genetics requires. But he quietly skims over this subject. Being a believer and not a critical student, he obviously expects others to believe him, without question. But no one will believe his statements before seeing exact data on experimental procedure, controls, and statistical checks. At present, it seems that Lysenko considers another line of his work to be most decisive. Following in the footsteps of Michurin, he and his school have grafted on a large scale and claim to have produced many "graft hybrids," which are supposed to show that the "juices" which flow from stock to scion and vice versa can change the scion (or stock) hereditarily into the type of the other. We can judge what he believes to be his greatest success, his star witness, because he staged a dramatic demonstration toward the end of his final remarks at the 1948 meeting mentioned above. He directly addressed the Academician Zhukovsky, who had doubted (like everybody else) the reality of the existence of vegetative hybrids, and declared in a triumphant tone that he now had the pleasure of demonstrating them. A tomato strain with full leaves and red oblong fruits was used as a stock to which a scion was grafted from a strain with pinnate leaves and yellowish white fruit. Seed was taken from fruits growing on the stock and on the scion and most behaved according to their origins. But a few plants taken from the seeds from the stock had pinnate leaves and yellow fruit. This, then, was his great result, produced dramatically at the height of his discussion. I am sure that the agronomists present were deeply impressed. But what did the geneticists think? Before Lysenko's unfounded interpretation could be discussed, one might ask, first, whether no genetical facts are known in explanation of the result, assuming that the experiment was made with genetically pure strains. It has been known ever since the classic work of Winkler and Baur that chimeras are produced in definite ways after grafting. This means that the tissues of the stock and scion can grow together into a whole. It was shown further that the subepidermal layer, from which the sex cells originate, can enter such a chimera from one or the other form used. The seed then will belong to the form which furnished the subepidermal layer, as Winkler proved by the chromosome counts in his nightshade-tomato grafts. (Winkler, by the way, produced also a single real graft hybrid or burdo, not by "juices" but by vegetative union of cells, as again proved by the chromosomes.) Obviously, the pinnate, yellow-producing seeds of Lysenko were pure descendants of the scion via subepidermal ingrowth into the stock. In this fact-founded interpretation cannot be disproved by real and decisive facts, Lysenko's top demonstration collapses. Thus far, I have not seen any hint that Lysenko was even aware of a simple genetical explanation for his results. [In his book, translated and published in 1946, Lysenko discusses chimeras (p. 57). In these paragraphs he surpasses himself in ignorance, if not actual ill will.]

It is not necessary to go on with a discussion of Lysenko's so-called factual material, when his own star-witness experiments are found wanting in every respect. To base a revolution in biology upon such material is certainly a feat of great optimism, though not of much self-criticism. *Parturiunt montes nascetur ridiculus mus.*

Pseudobiological literature of all times is full of books by philosophers, statesmen, theologians, and cranks who want to replace facts and laws found by the hard work of the active biologists with their own pet ideas or creeds. Lysenko would certainly join this group, which always finds followers among laymen, if he lived in the Western World, and his doings would remain a curiosity on a library shelf. However, his case otherwise completely uninteresting, has become entirely significant by the fact that he has succeeded in persuading the high command of the party, including, as it seems, the dictator himself, that his, Lysenko's, line is first, truly Marxian, second, of greatest importance for the economy of his country and full of practical promise, and, third, 100 percent Soviet Russian; further, that scientific genetics is anti-Marxian, capitalist-employed, a foreign importation, wrong in fact and theory and a hindrance to agricultural progress. Thus far, this is a local Russian affair. But when, in consequence, the politicians have given him the power to destroy a whole science of greatest achievement and to persecute its exponents, a situation has developed which must awaken the entire world. We know that Communism is a creed and that its believers everywhere will follow the party line religiously. We know that in the Eastern Zone of Germany, Lysenkoism is already being introduced in the high school curriculum. We know that the red-tainted Japanese youth is already flirting with Lysenkoism and that a large scale discussion of it is going on in the Japanese press. Thus, the freedom of science is in danger everywhere, and the local affair becomes one of universal concern.

WHAT AMERICA FACES

I do not want to imply that we are in danger of having a Lysenko appear in our midst. But there are different degrees of such things. This brings me back to the fourth recent development in science which I recounted in the introduction to this address, when I said that only small steps lead from organized teamwork to professional planners and finally to political control. I cannot help saying that I have followed with serious misgivings the increasing trend towards planned and organized science, though realizing its need in certain fields. Formerly, a scientist thought out or encountered a problem and started working on it. As often as not he found something in the course of the work which led him in a new direction. An occasional observation, which most others would have overlooked, led the born researcher into new fields, an unexpected flash of an idea opened new vistas and led to solutions or to more problems. All great ideas and all great discoveries in the realm of pure science have come into existence this way.

But now a man does not work on some subject or problem. He has a "project." A plan has been laid out, even worked out in all detail, a staff has been brought together and each one has been assigned his duty. An organization has approved the plan and furnished the funds; in return it expects progress reports, visible and quick results, and no deviation from the plan agreed upon. Everybody is happy to have a "project," and only Minerva covers her face and sends the owl away to catch mice.

I realize certainly that there are types of work which should be handled as organized "projects." If you want to prepare 200 stereoisomers of some organic compound and test their action as insecticides, a project is in order. If you want to eradicate a certain mosquito in a certain place, go and organize it. But how a major discovery or idea can come from a project I am unable to understand. This, however, is not what I want to discuss. I want, rather, to point to the danger to the freedom of science which lurks behind this way of making science. The danger will come from the men who are attracted to such a type of scientific big business. The thinker, the blaster of new paths, the keen observer, the man of intuition whose thinking is ahead of his time, will not flock to the big Government-financed and sponsored projects. Sooner or later leadership will fall to the university politician, the promoter, the men who make the headlines—headlines not in the history of discovery but in the press. Second-raters will attain the power that goes with big funds, and then the moment of danger arrives. They will favor what they like and understand, suppress what is beyond their vision. Being not too intelligent, they will fall prey to the flatterer, and will always go along with the latest scientific fashion or even the doubtful schemes of fanatics or reactionaries, and certainly always with well-entrenched schools. They will easily find the ear of the politicians who run the funds, for both talk the same language. At this point the setting is ready for a Lysenko type. Though our political system will not give him a chance to act as savagely as is possible in Russia, he could do enormous damage to the progress of science and the freedom of research if not checked in time. This sounds very pessimistic, but human nature is the same everywhere, fanatical activists are available everywhere if not kept in check, and men who believe in "politics as usual" are not only more numerous than men of original ideas but are also more selfish and ruthless. Thus, I believe that the increasing financial support of research, especially by government and political agencies, tending to flow into the channels of organized research, is fraught with the danger of bossism in science, with the danger of subsidizing mediocrity, and in the end with a threat to the freedom of science and its teaching. This is not to say that I am opposed to government funds' being set aside for fundamental research. This is a need of our time, a necessity. But precautions should be taken and a watchful eye should be kept to prevent usch funds from working to the detriment of real science. It is the young generation, who will profit from the incoming funds, who should also be alerted against the danger that politicians, both those within and those outside the universities, will take over science. The young researcher must insist upon the right to think for himself, to plan for himself, to make his own mistakes, and to be happy over an unplanned, unforseen discovery. Real progress in science has always been made and will always be made by the free mind, left to its own working under a system where science is free.

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Total Environment of Learning Needed

The mechanical organization of present liberal studies in our large universities is not reaching the aim which liberal education sets, which is to develop in each individual a cluster of liberal values. The average student in college today is educated anonymously by distant professors and standard textbooks. He appears several times a week in the company of two hundred to fifteen hundred others, and sits his way to graduation, pausing in his note-taking and underlining twice or more each term to make the series of correct grunts which comprise the usual objective examination. The human beings involved in this clutter of mimeographed sheets have lost their identity.

The situation is due only in part to the severe overcrowding. It is due, rather, to a dominant conception on the part of those who administer and plan the universities, as to how higher education should be conducted. The conveyance of subject matter by mechanical means was the standard pattern of arrangement before the present overcrowding began.

I suspect that if adequate funds were to become available to universities tomorrow, most of the money would be spent on buildings, printing, equipment and devices, with a small percentage of the budget devoted to plans for educating new teachers and for bringing more and better paid faculty members into the academies.

Unless we spend our money and effort on forming communities of scholars who are interested in teaching, and unless those communities are small enough or informal enough in organization to allow free exchange of opinion and knowledge amongst students and teachers, there is little hope that we can develop a genuinely liberal education. We must make the life of the college student an immersion in a total environment of learning, where the companionship of the scholar, the athlete, the wit and the artist are sought naturally and eagerly at various times and according to various needs.

I believe it is this ideal environment of learning which the President's Commission has in mind when it repeatedly emphasizes the need for an organic philosophy of education, and the need for following the logic of that philosophy in making the college into a genuine community. From the article "The Future of American Education," by President Harold Taylor, Sarah Lawrence College, in *The American Scholar*.

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BEETLE-BALM FOR GUAM

By SERGEANT WILLIAM MILHON
Leatherneck Staff Writer
Illustrated by Ex-Marine George Booth

At last: the answer to the question,
"What's eating what's eating Guam?"

By courtesy of the Marine Magazine LEATHERNECK

When word reached LEATHERNECK that Guam was being eaten by snails, there was much indignation. Why hadn't the Marines stationed in that area told us about it? There was an immediate suspicion that the boys on Guam didn't care.

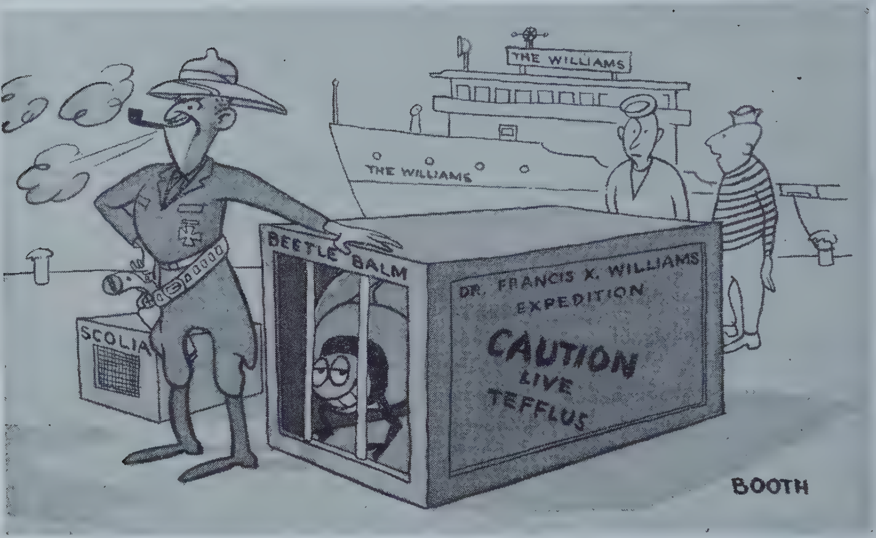
An unofficial poll taken around Headquarters bore out this theory. Those interviewed were approached very simply. "Snails are eating Guam. What should be done about it?"

RESULTS:

Something should be done	1%
Leave 'em eat it	93%
To hell with Guam	6%

This beautiful Pacific island has an agreeable and healthy climate—especially for snails. Snails like it.

With visions of Agana bluff slowly crumbling away, terrified Marines clinging to its teetering surface, and finally, the whole island sinking into



the ocean leaving an awful blank spot in the Marianas and a complement of Marines swimming frantically for Saipan or Tinian, LEATHERNECK got hot.

We went to one of the biggest snail men in the country, Mr. R. Tucker Abbott of the Smithsonian Institution in Washington, D. C. (Mr. Abbott was one of our allies in War II having been in the U.S. Navy).

"Certainly," said Mr. Abbott. "The snails are eating Guam."

"Could you tell me why, Sir?"

"There is no accounting for a snail's taste."

"Would you say, then, that the snails enjoy it?"

Abbott frowned. "The mental faculties of the snail are very limited. They could not be compared to mankind—so far as the capacity for enjoyment is concerned—except in rare instances."

"You wouldn't compare snails to Marines, then?"

Mr. Abbott regarded me thoughtfully. "Some Marines," he said. "However we may assume that they enjoy Guam in their own way."

"The Marines?"

"The snails," said Mr. Abbott, firmly.

"Is there a chance," I asked hopefully, "that the snails will eat Guam up entirely?"

Mr. Abbott shook his head wistfully. "I was there in '45," he added.

He explained that Guam produces quite a packet of food stuff on its 11,000 acres of land under cultivation. Native products such as sugar, mangoes, and cocoa. The United States has introduced many home-grown vegetables, fruits and Marines. Mr. Abbott pointed out that the snails were eating only the plant life, garbage and excrement. In fact, everything living or dead that smells bad or holds still long enough to be eaten.

"The *Achatina fulica* is very voracious." Mr. Abbott looked at the top of my head—where it comes to a point. "That means they like to eat."

He related how, in 1931, the giant snails attacked the island of Ceylon. "The snails even ate the whitewash off the walls of the buildings."

"Are they—big?"

"Not very. The adult *Achatina* is from four to six inches long. The large variety, *Achatina achatina*, attains a length of 12 inches or more."

"And there are zillions of 'em?"

Abbott nodded. "I've seen as many as 50 clinging to one small ten-foot tree. That was on Saipan. Our jeep skidded into a ditch one day. So many snails had been mashed on the road, driving was dangerous.

"Where do these snails come from?"

"Tropical Africa. They spread from Africa through various accidents and designs. Love, indirectly, brought them to Reunion Island in 1821. The governor of that island was very fond of his number one wife and she was very fond of snails. The governor imported them to his garden.

"Then in 1847 a scientist named Benson introduced them to Bengal and Calcutta. A sea captain named Hutton carried them to the Western Himalayas. Since then they've spread all over the Orient."

"How about Guam?"

"The Japs brought them in," said Abbott. "The Japs introduced giant snails into the Philippines and Saipan and Tinian in 1940."

"The snail was their secret weapon?"

Abbott grinned. "Have you had lunch?"

"Thank you, yes."

"The Japs eat the snails," he explained. "Make soups and stews of them. Are you ill, Sir?"

"I don't (gulp) imagine snails (gag) would taste—very—good."

"I don't know," admitted Mr. Abbott, sadly. "I have never tasted *Achatina*. It is a great loss to science. The Chamarros, natives of Guam, won't eat them either."

"Why don't they kill these snails?"

"Oh, they do. The best way to kill a giant snail is to hit it with a baseball bat."

"How about DDT?"

"Snails like it. In fact, test animals fed on DDT seemed to grow bigger and stronger. Poisons have been tried of course. In Malaya, bait-balls made of rice-bran mixed with "meta fuel" seemed to work pretty well."

"Is science going to sit around and let Guam go to the d—, the snails?"

Mr. Abbott smiled at my ignorance. He told me that the National Research Council had already sent a scientist to Africa to study the giant snail in its native haunt. The scientist, Dr. Francis X. Williams of Honolulu, famed for his work against insect pests in the Hawaiian Islands, would probably find some animal in Africa that eats giant snails.

"I know of two," said Abbott. "One is a smaller snail that eats the eggs of the *Achatina*. The other is a lizard. This lizard loves giant snails."

"Well, why don't they—"

"The little snails, after they exterminate the big ones, might take a notion to eat everything else on Guam. And the lizards—well who wants a million lizards running around?"

"I see," I said.

Then Mr. Abbott went into the sex life of the giant snail. (Since LEATH-

ERNECK passes through the Post Office, on its way to subscribers, we cannot print this in detail.)

* * *

"No kidding," I said, wiping the sweat off my brow.

"Quite."

"Uh, Mr. Abbott, do you have any suggestions as to overcoming this snail menace?"

He had.

"It wouldn't cost much to put up a canning factory. I think the snails should be captured, canned, and sold back to the Japanese."

Which is the smartest idea I've ever heard of. Commercial, too. I told Mr. Abbott I thought he had a brilliant plan.

"I got a million of 'em," he said modestly.

Mr. Abbott, I learned, was educated at Harvard, has written text books on snails that carry tropical diseases (especially schistosomiasis) and is at present assistant curator of Mollusks at the Smithsonian Institution. This doesn't interfere with his sense of humor.

He telephoned me a few days after our interview.

"Another report on Guam," he said.

"Is Guam eaten?" I inquired, hopefully.

"No. Dr. Francis X. Williams has returned from Africa. He has brought back beetle balm."

I changed ears. "Would you repeat that, please?"

"Beetle balm for Guam," said Abbott.

He explained all about the beetle called *Tefflus* which is at its happiest when munching on a giant snail. The *Tefflus* beetles will be very happy on Guam. "Guam has beetles already," said Abbott, "but they don't care for snails. Therefore a change of beetles is necessary."

"Will they transfer the native beetles?"

"No. The Williams' expedition has brought back a bunch of *Scolia* wasps. *The wasps will eat the native beetles.*"

"Guam is saved?"

"Possibly."

"One more question, Mr. Abbott."

"Shoot."

"Do *Scolia* wasps bite Marines?"

"Time," reported Mr. Abbott, "will tell!"

Liberal versus Technical

We want to produce men who have a broad understanding of the world in which they live; who are free of superstition and error; who understand the techniques in the various fields of sports; who have achieved a certain competence in at least one avenue; who, in addition, from their studies have come to know the best standards of value and are not afraid to make value judgments; and who, finally, have such motivation that they will use this education in the service of their country and of mankind.

The methods by which the liberal arts colleges are seeking to attain these objectives are much less clear and they constitute the major problem that faces us today. There is a welter of experiment and endeavor in the colleges of this country but it is not too much to hope that as our objectives become clearer, our methods and techniques will be slowly improved. It is a very interesting possibility that as our higher education in America develops in the next decades, we will find a rather surprising drawing together of what we have thought of as technical education and what we have thought of as liberal arts education. The technical schools and the engineering schools have been introducing what they usually call humanistic studies in the first two years particularly of their curriculum. These humanistic studies parallel very much the studies through which we are trying to secure credit in the liberal arts college. — President Charles W. Cole, Amherst College, at the inauguration of President Jess Harrison Davis, Clarkson College of Technology.

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MOUNTING SMALL SPECIMENS IN PLASTIC

By VICTOR H. DIETZ, D.D.S.
Research Fellow of the National Institute of Health

The use of the natural and synthetic resins commonly employed for the purpose of mounting coverslips to microscopic slides has proved inadequate when used for deep mounting purposes. The most common objections being the assumption of a dark amber-like color through the years, vacuolization occurring within the mass of material, and the fact that the object itself may float within a void due to some synerized fraction of the mounting medium.

This technique is particularly applicable when it is desired to permanently preserve small whole embryological, botanical, parisitological, entomological, and other biological specimens. The technique is easily expanded to greater proportions for the purpose of preserving larger objects. The usual procedures for fixing, clearing, staining, and dessicating specimens are observed when required. All objects to be embedded must be free of water moisture upon the exterior and have not in excess of a mere film of oil as ordinarily imparted by clearing agents. Drying most objects at 55°C for a few hours upon a blotter normally suffices.

A sheet of Plexiglas or Lucite of 1/16″ thickness cut to 1″x3″ dimensions serves of necessity, in lieu of the glass slide. The edges of the slide should be polished with pumice and water upon a large rag wheel rotating at medium speed on a polishing lathe. It is finished to a smooth, brilliant and lustrous surface by the use of SnO_2, $CaCO_3$, or jeweler's rouge using a new clean soft rag wheel. If such facilities are not available, local plastic concerns can usually furnish the finished slides.

A glass investing ring, of admirable design, is made by cutting off the mouth end of a test tube (with flared lip) to a ¼″ or ½″ height as required by the object. A test tube of adequate diameter should be selected to allow a sufficient peripheral mass around the object to be invested. The glass ring is inverted upon the center of the plastic slide thereby resting upon the mouth (not cut) end. The lip of the test tube assures a graceful quarter-round blend into the surface of the plastic slide. Pour Castolite* liquid casting plastic into a teaspoon until ¾ full and add one drop of the Castolite hardener and mix thoroughly for one minute with a toothpick. These quantities are not especially critical and do not require refined measuring techniques. After a thorough mix is procured pour three to five drops of the Castolite from the teaspoon into the center of the ring until the area within the ring is just barely covered. The proper amount of Castolite will effect a capillary seal around the periphery of the lip of the ring. If the amount should be the slightest in excess it will escape from under the ring and flow over the slide. Should this occur it will necessitate considerable additional work and effort to sandpaper this off and to repolish the surface of the slide.

The slide at this point of assembly is now placed in the lower (55°C) compartment of a slide oven for approximately 20 minutes. A strong interface bond is now established between the liquid plastic and the plastic slide. A second layer is now poured, from the teaspoon, over the first layer to a height that will just cover the object. The object is now carefully oriented in this upper liquid stratum of plastic. Any bubbles around the object are teased away from it to

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*The Castolite liquid plastic, hardener, and other appurtenances are included in a kit which may be procured from—

The Castolite Company
Woodstock, Illinois

the surface and the periphery with a dissecting needle. The slide is now returned to the 55°C compartment for approximately 5 minutes and again removed at which time the object is repositioned and any new bubbles which may have formed are again teased away. The object must occasionally be depressed as it invariably has a tendency to float to the surface. This 5 minute heating and repositioning procedure is continued until the plastic adequately solidifies which is determined by probing the surface of the plastic and ultimately noting its rubbery consistency. If the surface over the top of the object is less than 1/16" in thickness a few additional drops of the plastic are added.

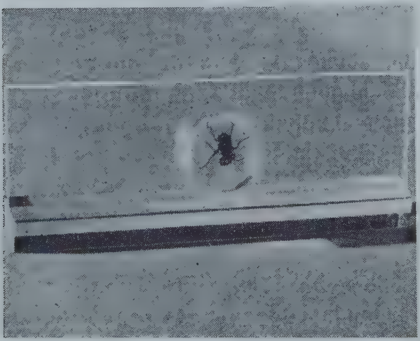

Fig. 1. The perfect clarity of the entomological specimen may be seen in the slide. For macroscopic exhibit, the slide may be placed in a commercially available place card plastic base as shown. This all-plastic assembly is virtually unbreakable, however, indiscreet and excessive handling may scratch the plastic. Contact with organic solvents should be judiciously avoided.

The slide is now placed in a 55°C oven and the ring is covered with a glass slide. This feature eliminates excess air from contacting the exposed top layer which invariably results in a sticky and dimpled surface should this step not be observed. Heating is now continued for an additional 20 minutes and the slide removed from the oven and allowed to cool to room temperature (about 20 minutes). During this period the heat must be permitted to evolve slowly as actual polymerization (solidification) is initiated upon cooling. Rapid cooling at this time sets up strains in the plastic and may cause crazing. This phenomenon is apparent when numerous fine hair-like cracks appear throughout the mass in a filigree or mosaic pattern. Its occurrence is wholly ruinous to the optical clarity and perfection desired.

At the conclusion of the drying period the glass slide is removed and the plastic slide is now completely polymerized or cured by heating for one to two hours or longer. At the end of this time it is again allowed to cool to room temperature (20 minutes) and is then immersed in cold water. The slight inherent shrinkage incident to polymerization should enable one to readily remove the glass ring. If properly executed there may be absolutely no need for polishing. However, the inevitable occurrence of a slight concave meniscus may cause a peripheral spherical aberration. Should this prove objectionable the slide should be inverted upon "00" sandpaper and reduced to a flat surface. It will now have a frosted appearance which must be carefully polished by the aforementioned method as applied to the edges of the plastic slide.

N.B.—The technique may be greatly expedited by employing higher temperatures but was presented in its entirety in such a way that it may be executed in the ordinary microtechnical laboratory with only a minimum of additional equipment. The entire technique is most easily carried out upon a thermostatically controlled hot plate if such a device is available. The hot plate may be maintained at approximately 75°C and the time intervals given herein may then be virtually halved.

The Kellog Institute of Graduate and Postgraduate Dentistry, University of Michigan, Ann Arbor, Michigan.

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ALBUQUERQUE SCIENTIFIC SESSION

Abstracts of Papers Presented December 29, 1948

1. Observations on the Fleas of New Mexico.

Leila Williams, University of New Mexico.

To date plague has been reported in four counties of New Mexico. Yet, there has been very little work on the fleas of this state. In the course of this work specimens were collected from both the rodents and their nests. Animals to be examined were kept in a refrigerator. Flease were concentrated from material of the nests by the use of a funnel and a light above it. Clearing was accomplished with KOH; washing in water; dehydration in creosote. Taxonomic characters were demonstrated with the use of microscope slide projection. Altogether some forty-five hosts were examined, as well as the nests of wood rats and kangaroo rats. As many as 910 fleas were taken from a single nest. Some interesting sex ratios were observed.

2. Studies in Fish Embryology.

Perry Max Johnson, University of Michigan.

These studies were carried on with the Large Mouth Black Bass. The work concerned mainly the germ cell history. The early embryological development in this species revealed striking differences from the conventional processes reported in most text books. The germ layers form by a process of delamination. Several interesting and unusual differences in the formation of the circulatory, nervous and digestive systems.

3. Life Zones in New Mexico.

Larry Gordon, University of New Mexico.

The area studied was one that was overgrazed for centuries. In 1936 a fence prevented grazing in one area while the adjoining region remained in the overgrazed category. The two regions were studied and the small mammals in them were trapped after eight years had passed to permit the established of a somewhat balanced condition. Slides were shown to illustrate the better grass cover on the protected area as compared to the scarcity of grasses in the over-grazed region. Quadrats were used to get a comparative difference in both zones. The overgrazed region supported a larger population of certain mammals.

4. The Biology and Ecology of the Aquatic Hemiptera of Florida.

Jon L. Herring, University of Florida.

In this study some sixty forms of Hemiptera are being considered. The life history of several (about thirty) has been investigated. It was indicated that the fact of continuous breeding throughout the year permitted more observations and a more ready solution to life history than would otherwise be possible. Information on distribution is also being obtained. At this stage in these studies there is evidence that the Hemiptera of Florida are related to those of the West Indies, Yucatan and Mexico. Some interesting extension of the range of certain marine forms into fresh-water and vice versa were also reported.

5. Research and Teaching Opportunities at the Montana State University Biological Station.

Charles D. Haynes, Jr., Montana State University.

Read by title.

6. The Influence of Amino Acid Nutrition on a Ciliated Protozoan *(Glaucoma tetrahymena)*.

Armstrong M. Dowell, Jr., University of California at Los Angeles.

This species of protozoan has proven especially useful in studies of cellular physiology. At first this work was mainly centered on a correlation problem, but now efforts are being made to solve several pure aspects in the biology of this ciliate. These animals are comparatively easy to manage in media which are quite well known chemically. Some confusion existed in earlier stages of work with this organism because the same animal was given several different names. More recently the morphology and taxonomy has been studied and this clarification has helped those concerned with such studies as physiological chemistry of these forms. Difficulties and specific problems are now centered in methods of staining, as well as in matters pertaining to respiration.

7. DIRECT STIMULATION OF STRIATED MUSCLE.

Dr. Efrain G. Pardo, University of Mexico.

This study was carried on as collateral research dealing with the action of drugs on certain studies. An attempt was made to apply the concept of the massimal stimulus. In an effort to obtain some measure of the amount of stimulus needed for contraction striated muscle was used. Invariably the muscle tissue burned before a measure of the massimal stimulus could be measured. Since the concept is based on the all or none principle the massimal should appear at the point where all of the tissue elements contract. In this work such a point seemed impossible to attain and as a consequence it is becoming more and more clear that the "all or none" concept as applied to muscle contraction is being doubted.

8. THE PRESENT STATUS OF WORK IN OPHIDIAN CYTOGENETICS.

W. H. Jones-Burdick, University of Colorado.

This field has gone without special consideration in our country. In the light of some work done along this line by a Japanese worker there is a probability that relationships may be determined in this approach. The studies of the chromosome number in the cells of snakes in Japan revealed that there were a basic number of 48. The speaker said: "I am not sure of the implications of this number!" The grouping and patterns of the chromosomes in the nucleus were very definite so that interesting results might be revealed by work of this kind. Since the nuclei are so unusually small such a study will involve very difficult technique.

9. HUMAN GENETICS.

James H. Leech, University of Texas.

In working with humans it is necessary to apply some rather carefully worked out methods for interviewing subjects in an effort to get accurate data. A combination involving knowledge of mathematics, medicine, and psychology is desirable. The information gathered involves a wide range of characters. Among diseases the file on cancer is the largest at present. Older workers are concentrating on cancer while students restrict their studies to taste testing and the like among the members of the freshman biology classes. In all of this work great care is taken to avoid taking unreliable data.

10. ON THE NATURAL HISTORY OF OREGON.

Kenneth M. Walker, University and State College of Oregon.

The speaker gave a short resume of the various studies which are being carried on in the institution he represented. In order to give a better appreciation of the possibilities for work in that state he indicated that studies were possible in conditions varying from marine through most aspects of land and fresh-water all the way up to the Alpine. The conditions are extremely variable and there is a remarkable diversity in the fauna and flora of that state. The work being done by students and staff of the University there involves studies in: fisheries, oyster culture, herpetology, ornithology, mammals, local lists, ecology, etc. At present considerable progress is being made in the establishment of a natural history museum.

EDITORIALS

HONORARY MEMBERS—

From the inception of Phi Sigma every issue of the Coustitution has carried among its membership prescriptions, a paragraph on Honorary Members.

So enthusiastically was this provision accepted in years gone by that it was not unknown for some chapters to elect as many as three or four honorary members in a single year. This promised to become an abuse, but more than one national meeting took the matter under advisement, drafting what appeared to be appropriate regulations to prevent the situation from getting out of hand, and to make such membership an honor both to the recipient and to the chapter conferring. These constitutional provisions, if carefully and thoughtfully studied, will be seen to provide against apple-polishing moves by campus politicians on the one hand and glory-grabbing by ambitious but nationally unknown professors on the other. The technique of electing honorary members thus evolved through the years is not cumbersome. The constitutional provisions put the decision as to the eligibility of the nominee in the hands of the Council, which, incidentally, has had very few occasions to turn down any chapter's nominee, so well have the chapters chosen their candidates. Before announcing their choices, however, the nominating chapters, should give the council secretary sufficient time to poll all the council members for their votes, a procedure which normally takes two or three weeks.

Unfortunately many of the honorary members elected in the pre-war years have been dropping under the scythe of the Grim Reaper. Many of our chapters, if they trouble to search their records, may be surprised to find that they are without a single honorary member.

One last point might be made here. There is no constitutional restriction on the location of the biologist nominated to the honors of Phi Sigma. While it is true that most of the larger chapters have preferred to choose some research professor on their own campuses, the smaller school chapters wisely chose visiting lecturers or professors for their honors. Thus, the great research chemist and editor of "The Midland Naturalist," Dr. Julius A. Nieuland of Notre Dame, and that that great conservationist Governor of Pennsylvania, Gifford Pinchot, were both members of Nu Chapter. Yale's famous teacher of Protozoology, Dr. Lorande Loss Woodruff, and Chicago's equally noted organic physiologist, Anton J. Carlson, both were honored by, and in turn honored the chapter in accepting membership from Omega at the University of Oklahoma.

It is true that the passing years have filled the chairs of many of the great research professorships of the leading universities with former active members of Phi Sigma. That is something for which Phi Sigma has a just right to be proud.

However, there is a large and growing corps of leaders in the biological sciences who have now attained positions in the scientific world which eminently qualify them for honorary membership in our society.

It might be well for our chapters to take serious thought of this possibility, and return to one of Phi Sigmas cherished traditions,—that every class of initiates should include at least one honorary member.

The members of the Council are aware from their own experience that nothing is more impressive to the initiates in active membership than to enter the nominating chapter in the company with some great and nationally or inter-nationally known leader in biological sciences.

HOW TO WRITE UP RESEARCH—

A puzzling and quite unexpected amount of variation is exhibited by many at the beginning research papers thus far contributed to "The Biologist." Evidently some of our contributors are not very observant or have not seen fit to ask for advice on this very important phase of research,—the adequate and accurate presentation of their findings.

There are certain traditional techniques of presentation to which all experienced writers of research papers have learned to conform. Moreover in many colleges and most universities there is a prescribed form or a manual of style on which all theses, dissertations and research reports,—whether published or not,—must be patterned. Ordinarily these forms conform reasonably close to those in use in standard scientific or intellectual publications.

Any normally sharp student should not need instruction on these points. For the benefit of those who need detailed direction most libraries have copies of the University of Chicago "Manual of Style." For the small sum of thirty cents the short treatise on this subject: "A Manual for Writers of Dissertations" by Kate L. Turabian, may be obtained from the University of Chicago Bookstore, Chicago 37, Illinois.

Good examples of accurate and adequate preparation of short research papers can be easily seen in every issue of standard biological journals.

The main difficulty with some of the papers thus far submitted to "The Biologist" has been the inadequate preparation of the list of works referred to by the author.

English scientists generally prefer to present their references as numbered footnotes on each page of their script. American writers, however, usually present them as an alphabetical bibliography at the end of the article, each reference being numbered, and the number inserted at the proper spot in the body of the text.

It stands to reason that all references must be accurate and complete. Only in the case of the classical scientists, Darwin, Mendel, and the like, can one dare to refer in a general way to their works,—and then only when no specific statement is quoted. All other statements, or theories referred to should be numbered, and the particular book, or magazine article, listed beyond any danger of misunderstanding. Here is an acceptable and simple way to present references in a bibliography for our magazine.

1. FRANK, J., and LOOMIS, W., (Editors)., "Photosynthesis in Plants," The Iowa State College Press, Ames, Iowa, 1949.
2. GOLDSCHMIDT, RICHARD B., "Research and Politics," "*The Biologist*," Vol. 30, No. 3, May 1949, p. 3 ff.
3. HUBBS, CARL L. and LAGLER, KARL F., "Fishes of the Great Lakes Region," Bulletin No. 26, Cranbrook Institute of Science, Bloomfield Hills, Mich., 1947.
4. LAGLER, KARL F., "Studies in Freshwater Fishery Biology," J. W. Edwards, Publisher, Ann Arbor, Michigan, 1949.

You will note that the capitalized names of all responsible authors or editors are arranged alphabetically. If an author has two or more works to be referred to, his name may be repeated or a fairly long dash substituted. The titles of the works follow one another in chronological order.

Titles of all articles or books are underlined. Periodicals in which articles appear may be placed within quotation marks, or, if printed (not typewritten) by the use of italic type as above in the Goldschmidt reference.

Articles from periodicals should be indicated by volume number, month, year and pages included.

References to books should give the name of the publishers, the place and year of publication.

In the interests of scientific accuracy the Editor of this periodical will be forced henceforth to return to their authors all manuscripts which do not meet the foregoing qualifications. He will request that the article be resubmitted with suggested changes. By so doing your Editor will be making more work for himself, but *IF* thereby he helps new adventurers in the field of biological research to better habits of preparation for publication he will be more than amply repaid.

CASTING SHADOWS BEFORE

While this February issue of "*The Biologist*" is being distributed, copy for the May issue will be in press, and the completed issue should be in your hands very shortly. In addition to several good examples of beginning research from Phi Sigma members, there will be a thought provoking article on opportunities for biologists from the pen of Dr. Donald J. Zinn of Rhode Island State College. There will be a new department of biological news and novelties from the foreign press, and some reference to sources for biological motion pictures. There also will be a short sketch about a member of Phi Sigma who entered congress this session. In addition to all this there will be the usual editorial page, book reviews, and late chapter news, if any arrives before the press date. The Editor would like to have your opinion on the possible use of what old-timers used to call "The Agony Column." This would be a section devoted to letters of the "Readers Speak to Readers" type. It works in many magazines. Would there be any use for such a section in "*The Biologist?*" Let us hear from you if you think it would work. You might send us a sample letter.

ACKNOWLEDGEMENTS TO "LEATHERNECK"

Phi Sigma and "The BIOLOGIST" owe a vote of thanks to Major J. A. Donovan, Jr., USMC, the Editor-Publisher of the Marine's own magazine, "The Leatherneck," for permission to use the zany account of some biological events in one of our Pacific islands. The story is from the inspired pen of Marine Sergeant William Milhon, and the illustrations are by ex-Marine George Booth. There *is* a Dr. F. X. Williams in "American Men of Science," and Cooke mentioned the movement of "the great *Achatina fulica* from Africa to Mauritius, and thence to the Seychelles and Calcutta," as far back as 1913. We frankly don't know how much of this story is truth and how much spoof. In any case, it's the kind of a yarn that predisposes one to enjoy having his leg pulled. Biology needs more of this sort of approach. And, as usual, "The Marines have landed, and have the situation well in hand." Thanks, men!

On Understanding Science

Possibly the Terry lectures "On Understanding Science," delivered last year at Yale by President Conant of Harvard, may have had something to do with Yale's decision to give a humanistic science course for undergraduates in the liberal arts—undergraduates who are not majoring in science. At any rate, the Yale course is to aid in bringing about "the closer integration of the sciences and the humanities in the college cirriculum and to emphasize the contribution of the sciences to liberal education."

President Conant, who is to carry out his ideas at Harvard in lectures that he will deliver himself, adopts what he calls the case method. That is, he shows how a single discovery came to be made, how it inspired more research and thus led to more discoveries, and what their social effects were. Yale's course will approach the problem of undergraduate scientific education differently. "The Age of the Earth," "The Basis of Heridity," "The Development of the Organisms," the "Chemical Basis of Life" are titles that speak for themselves. But the purpose of the Harvard and Yale courses is the same. That purpose, as the Yale announcement has it, "is to lead to an understanding of the sciences by tracing the sequence of events by which scientific facts are established and scientific hypotheses are developed." Social factors are also to be considered, that is, the factors which have influenced the course of science . . .

Yale and Harvard are about to make a momentous experiment in higher education. It's about time. Science has been taught too long in liberal arts courses as if it were a subject that ought to be "taken" only by young men and women who intend to become professional chemists, biologists, and physicists. Most of our economic problems have been thrust upon us by the development of science and technology.—Waldemar Kaempffert, in *New York Times*.

NEW BOOKS

This section offers brief uncritical reports on the general content of recent publications in biological and related fields. Only the longer critical reviews will be signed. For quick location on library shelves, each notice will be preceded, wherever possible, by three groups of numbers, the first two of which will be the Dewey and the Library of Congress classified numbers respectively. The third group is the L.C. card number, for the convenience of Librarians.

AMERICAN BIRD SONGS, recorded by the Albert R. Branch Bird Song Foundation, Comstock Publishing Company, Inc., Ithaca, New York.

This book is unique in that it consists of only six pages, each of which is a pocket, and each pocket contains one bright red, 10-inch vinylite record on each surface of which is recorded the songs of six different birds.

Each of the discs presents a different ecological bird grouping. The first record gives the songs of the birds of the northwoods, the second those from northern gardens and shade trees. Then follow in order—birds of southern woods and gardens, birds of the field and prairies, North American game birds. The sixth record is devoted to the western birds.

Without detracting in the least from what must always be recognized as the first great collection of our American bird songs, the interested listener might be pardoned if he noted a few characteristics which detract from the aesthetic pleasure or the more practical utility to be derived from such an unusual collection as this.

Each sound track begins with the announcement of the type of bird song presented, but unfortunately the sound track is continuous and one who wishes to demonstrate only one or the other call has to run through the whole recording to find it, or run the risk of damaging the record by dropping the needle where he guesses or hopes the song begins. Discontinuous sound tracks might have avoided this difficulty.

One misses the recordings of the mourning dove, the brown thrush, the common house wren, the wild canaries and the raincall of the robin. These were all included in the old records that used to be on the Victor record list.

Another, but perhaps inevitable corallary of collecting bird songs from all over the country, is that the original recordings are of very uneven quality. In some cases it sounds as if the first sound track must have been made with inferior equipment. When the various songs were assembled on the master record the "needle hush" of the poorer source material stands out like an off-key instrument in a musical organization. This is particularly bad on the recordings of the song sparrow, indigo bunting, brown thrasher, spotted sandpiper, wren tit, box sparrow, lazuli bunting.

One other defect, in all probability the most impossible to overcome, is the inability of ordinary recording equipment to catch the out-of-range tones of some birds. In their songs they run up into almost supersonic ranges, or trill so rapidly that the recording device at ordinary speeds can't vibrate that fast. These defects are apparent in the song of the bobolink, the veery and the Savannah sparrow.

Annoying as the foregoing few mechanical limitations may be, they are quickly forgotten in the pleasure, some of it nostalgic, to be derived from the set as a whole. Particularly good, to the critic's ears, are the recordings of the songs of the yellow-bellied sapsucker, the flicker, indigo bunting, orchard oriole (incidentally much better than its northern Baltimorean relative), the cardinal, Canada geese and mallards.

Some of the recordings should be brought to the attention of radio sound effects men. The burrowing owl could easily be dubbed in for an Australian locomotive, and the woodcock would double for the honking of a Parisian taxi-cab on the Champs d'Elysee.

Other recordings are especially intriguing due to the fact that the originals could not be recorded in private auditions. The woods were full of other birds whose voices form a background pattern of song. This lends fascination to the songs of chickadee, the yellow breasted chat, the mocking bird, kildeer, and the California shrike. The Baltimore oriole sound track is enhanced towards the end by an unmistakable crow from a very ordinary and unesthestic specimen of *gallus domesticus!* The song of the scarlet tanager must have awakened kindred emotions in the breast of some far off competitor, whose echoing voice is faintly yet distinctly audible.

If we were to choose one single record out of the set for its unique character, not necessarly its musical interest, we should in all probability take the fifth,—devoted to North American game birds. It starts out with the drumming of the ruffed grouse,—which for all the world sounds like the puffing of a very tired little freight engine trying to get a start up a hill. This is followed by the very familiar bob-white call, and the wild turkeys which sound remarkably like their domesticated cousins. The dusky grouse sounds like a shortwinded person blowing over a widemouthed bottle. prairie chicken rates the books' Oscar for weirdly mysterious sounds. It's a good thing prairie chickens aren't nocturnal. Almost anyone would quicken his steps if he heard this call when abroad at night. An imaginative cheer leader could do wonders with the chacalaca calls if he could build a football cheer around them. The call is almost as onomatapoetic as the bird's name. Reenforced in a flock, the chacalaca give a fair counterfeit of an excited mob.

Turning the record over, we first meet the Gambel's quail, not the hiccuping baby which its call resembles. The California quail makes enough noise to be the national bird of Hollywood press agents. The wood-cock is the bird that gets the all high rating for unusual calls. They range all the way from rather vigorous bronx cheers down to distinctly stercoral noises. The last two recordings are remarkably natural Canada geese and mallards. Why hasn't someone noted the resemblance of the massed geese to a flock of quarreling seagulls?

Into the drear and the drab of ordinary living the birds of the land bring a measure of color and interest, not only by their appearance or by their habits but mostly by their songs. In the catching and preserving them for our listening pleasure these recordings make a great step forward. It is to be hoped that the funds of the Albert R. Branch Bird Song Foundation are sufficiently ample to carry on the collecting and recording of other birds, and the perfecting of what is already both mechanically and artistically well done.

By Anselm M. Keefe

ADVENTURES WITH ANIMALS AND PLANTS, by Elsbeth Kraeber and Walter H. Wolff, D. C. Heath and Co., Boston, Mass., $3.20.

This book looks like an interesting, well illustrated and practical high school textbook in biology. The authors are experienced teachers in the New York City public school system. Their textbook is well documented, with a very complete bibliography for consultation, leading questions for review at the end of each chapter, exercises for the ordinary students, and further activities for the more advance and eager.

THE AMATEUR NATURALIST'S HANDBOOK, by Vinson Brawn, Little Brown and Co., Boston, Mass., $3.50.

Here is the handbook most of us have been looking for,—maybe for our own use, in handling Boy or Girl Scouts,—maybe as an incentive for young high school students,—maybe as a gift for the youngsters with biological interests who need more help than most of us are able to give them. There is more than a pinch of shrewd adolescent psychology salting this work. It is so well organized, and so interestingly put together, that considerably elder than adolescent people will find it hard to lay down.

ANATOMY OF PARADISE, by J. C. Turnas, William Sloane Associates, Inc., 119 West 57th St., New York 19, N. Y., $5.00.

In this highly talked-up book the author strives to compress most of his Pacific travels into 489 pages, bibliography and index not included. Readers who served in the Southwest or Central Pacific Forces will not be impressed—especially those whose lives, or whose buddies' lives, were saved by the care or curtesies of the "Mission Boys" among the native population. This is one of those whisky-and-soda-Bah-Jove-in-the - Raffles - Hotel - verandah sort of things.

ANIMAL BIOLOGY, by Michael J. Guyer, Harper and Brothers, New York, $4.50.

590 QL48.G93 46-2557

This fourth revision shows that books can grow with use. It has 757 pages, exclusive of three pages of visual aids,—a most valuable addition,—and a 19-page index of nearly 2500 subjects. This work more closely approximates a typical British production in the field than anything existant in American college texts.

ANIMAL BREEDING, by Laurence M. Winters, John Wiley and Sons, Inc., New York, N. Y., $4.50.

636.0824 SF105.W65 Agr 48-381

This is the fourth and thoroughly revised edition of a well known text by the professor of animal husbandry at the University of Minnesota. Aside from its practical applications in animal husbandry courses, it seems obvious that this would afford interesting collateral reading in any course in genetics. The closing chapters on building superior germ plasm are especially worthy of a genetic student's attention as well as an agriculturalist's.

ATLANTIC REEF CORALS, by F. G. Walton Smith, University of Miami Press, Coral Gables, Fla., $3.75.

593.6 QL377.C555

This beautifully illustrated volume has forty-one excellent plates of coral skeletons. As far as identification goes the book has little to say about living coral polyps, but there is a brief treatment of some six pages. The taxonomy is based on T. W. Vaughan and J. W. Wells, "Revision of the Scleractinia," 1943. This little book is particularly happy in its explanation of the "whys?" of reef forming corals,—why they are only found on the eastern shores of the continents, etc.

THE AVIAN EGG, by A. L. and A. J Romanoff. John Wiley and Sons, Inc., 440 Fourth Ave., New York 16, N. Y., $15.00.

598.2 QL675.R6 49-1116

If there is anything knowable about the eggs of birds that hasn't been included in the authoritative and monumental 918-page work it can't be of much account. (Like the use of egg for settling coffee for instance—which isn't mentioned.) The book is divided into three parts. The first is devoted to the biology of the egg, its origin, development, structure, and teratology. The second discusses the chemical composition, physico-chemical, and biological properties. The third part is devoted to the food value, the preservation and industrial uses of eggs. There are some 63 pages of bibliography, and a 45-page index.

BACTERIOLOGY, by Fred W. Tanner and Fred W. Tanner, Jr., John Wiley and Sons, Inc., New York, N. Y., $4.50.

589.95 QR41.T2 48-2007

The positions of the Doctors Tanner in the University of Illinois and the U.S.D.A. are the best warrant for this revised fourth edition of a well-known standard textbook. New chapters present ultra microscopic forms and discuss the variability of microorganisms. The latter paragraphs of this chapter are particularly stimulating. The fine-print examples of recorded applications of bacteriological techniques to epidemics, public health, criminology, etc., are something more or less new.

BEGINNER'S GUIDE TO WILD FLOWERS, by Ethel H. Hausman, G. P. Putnam's Sons, New York, N. Y., $3.50.

582.13 QK118.H3 48-3074

This is not a botanist's key to the wild flowers, but botanists and other interested people may find it handy in running down species of some 1080 flowering sprays which are printed large and clearly three to a page beside the text, and grouped from monocots to compositae in five sections: white or whitish, yellow or orange, pink or red, blue or violet, green or brown.

BEES WAYS, by GEORGE DE CLYVER CURTIS, Houghton Mifflin Co., Boston, Mass., $2.75.

595.799 QL568.A6C8 Agr 48-43

This new book by an architect and manuscript specialist (turned bee keeper) is something very much more than a handy manual for bee keepers, Boy Scouts or the unprofessionally curious. It is a collection of much scattered information from many sources all welded together in a consistent and practical whole by an experienced amateur. The book unfortunately lacks an index which would have made it so much more serviceable.

BIOCHEMICAL EVOLUTION, by MARCEL FLORKIN, Academic Press, Inc., 125 East 23rd St., New York 10, N. Y., $4.00.

Dr. Sergius Morgulis of the University of Nebraska College of Medicine has translated, edited and augmented this original work by one of the staff members at the University of Liege, Belgium. In it the author has endeavored to construct an animal phylogenetic system based upon biochemistry. "This classification," the author says, "as far as our knowledge permits such a comparison, would be identical with the system elaborated by Cuvier and his collaborators at the beginning of the last century." There is much to stimulate an interested cytologist with a good background of research chemistry. The author is teaching in the same university that saw the work of Schwann, who, with Schleiden, is credited with the origin of modern cytology.

BIRD DISPLAY AND BEHAVIOR, by EDWARD A. ARMSTRONG, Oxford University Press, 114 Fifth Avenue, New York 11, N. Y., $5.50.

In 1942 the author, then at Leeds, published the original of this work under the title of "Bird Display, An Introduction to the Study of Bird Psychology." Because the revision of the older work has been so extensive and so much new matter has been added this edition has been retitled. As in the previous work the author has sedulously avoided the all-too-common projection of human feelings and motives into avian behavior, without, however, becoming stilted in doing so. In the appendices there is an extensive list of the orders and families mentioned in the text, and 37 pages of what appears to be a most extensive bibliography. One commendable innovation is a split index,—the first part being devoted to birds and other forms, the second dealing only with subject matter. This book will interest animal behaviorists, and other psychologists, as well as the ecologically inclined. The illustrations are new, and unusual.

BIRDS OF PREY OF NORTHEASTERN NORTH AMERICA, by LEON ANGUSTUS HAUSMAN, Rutgers University Press, New Brunswick, N. J., $3.75.

598.9 QL696.A2H35 48-5916

Another gap in the natural history of the northeastern section of this continent has been filled in this discussion of the vultures, ospreys, falcons, hawks, eagles and owls of the area northeast of the cape May-Pittsburgh line. There are many satisfactory drawings in sepia of most of the forms discussed. Bird lovers and all conservationists will be interested in this work, especially for the number of false impressions regarding our predaceous birds which it corrects.

BOYS BOOK OF SNAKES, by PERCY A. MORRIS, The Ronald Press Co., 15 East 26th Street, New York 10, N. Y., $3.00.

598.12 QL666.06M815 48-9569

A more attractive and practical gift for a nature-wise youngster of either sex could hardly be imagined than this attractively illustrated and well written volume by the chief preparator of the Peabody Museum of Natural History in New Haven.

CHAMBERS' TECHNICAL DICTIONARY, Edited by C. F. TWENEY and L. E. C. HUGHES, the Macmillan Co., 60 Fifth Ave., New York, N. Y., $6.50.

40-30762

This revision brings a valuable desk-companion for every scientist of whatever persuasion and is as recent as cataroles, Gees, Loran, rebecca-eureka and tracer elements. In that it omits all the customary technical derivations (Websterian fine print) it can certainly be regarded as streamlined, yet it is nearly a thousand pages long. There is a supplement which includes the Greek alphabet, the alphabetical table of Chemical Elements, the periodic table, Igneous rocks, sedimentary rocks, the vegetable kingdom, and the animal kingdom, both considered down to the orders. Nearly one hundred phases of scientific and technological activity have been drawn on for the terms presented.

THE CHEMICAL FORMULARY, VOLUME VIII, Editor H. BENNETT, Chemical Publishing Co., Inc., Brooklyn, N. Y., $7.00.

The general utility of each new volume of this tried and true publication is a perennial source of wonder. This eighth volume maintains the highly useful level of its predecessors. The chapter on Food Products will interest the feminine side of the family.

COMPARATIVE PHYSIOLOGY, by BRADLEY T. SCHEER, John Wiley and Sons, Inc., New York, N. Y., $6.00.

591.1 QP31.S27 Med 48-1470

Departing from somewhat traditional (or hackneyed?) approaches to animal physiology Dr. Scheer has adopted the phylogenetic approach to animal physiology and thus offers not only to the advanced student, but also to the lecturer in general or advanced zoology, a comparative treatment of this subject, phylum by phylum, thus integrating the physiology into the anatomical treatment of the organism.

COMMERCIAL FLOWER FORCING, by ALEX LAURIE and D. C. KIPPLINGER, The Blakiston Co., 1012 Walnut St., Philadelphia 5, Pa., $4.75.

635.98 SB415.L3 Agr 44-228

The authors, who are respectively professor and assistant professor of floriculture in Ohio State University, here present the fifth edition of their original 1934 text book and florists manual. New developments incorporated into this work include constant level subirrigation, gravel culture, pest control by aerosols, photoperiodism in gardenias and chrysanthemums.

CONSERVATION IN THE UNITED STATES, by A. F. GUSTAFSON, C. H. GUISE, W. J. HAMILTON and A. RIES, Comstock Publishing Company, Inc., 124 Roberts Pl., Ithaca, N. Y., $5.00.

333 HC106.3.G885 44-5015

The combined efforts of emeritus professors of soil technology and geology, and the professors of forestry and zoology at Cornell University resulted in this text which appeared in 1939. This third edition appears with many of the newest references. The fields covered include the nation's resources in soil, water, forests, fish, game and fur, minerals, coal, petroleum and natural gas. Some of these have been developed over three or four chapters. The illustrations are unusually good, and new.

CRYSTALLINE ENZYMES, by JOHN H. NORTHROP, MOSES KUNITZ and ROGER M. HERRIOTT, Columbia University Press, New York, N. Y., $7.50.

612.0151 QP601.N67 48-6672

The second revised and enlarged edition of this authoritative work which was originally published in 1938 brings the last decade's work of the Rockefeller Institute for Medical Research up to date. The authors believe they have reduced all their research to a single problem—the mechanism of the Synthesis of proteins in general.

THE CULTIVATED SPECIES OF PRIMULA, by WALTER C. BLASDALE, the University of California Press, Berkeley 4, Calif., $7.50.

635.933672 SB413.P7B55 Agr 48-214

The British have long been addicts to the fascination of Primula raising. It remained for an emeritus chemistry professor in California to turn his hobby into the first authoritative American monograph on the subject. The first part of this work is devoted to an historical account of the genus, its biological peculiarities and its cultivation. There are fifteen chapters devoted to the various species.

DAIRY BACTERIOLOGY, by BERNARD W. HAMMER, John Wiley and Sons, Inc., New York, N. Y., $6.00.

637.1277 QR121.H19 48-2522

This third edition of a standard text by the former professor of dairy bacteriology at the University of Iowa has been brought into line with the more modern discoveries and techniques which have come into dairying during the two-score years since the volume first appeared.

THE EMBRYOLOGY OF THE PIG, by Bradley M. Patten, The Blakiston Company, 1012 Walnut Street, Philadelphia 5, Pa., $3.75.

591.3 QL959.P25 48-10874

The author introduces this third edition with a statement to the effect that the chief differences between it and its predecessors is in the improvement of the original presentation and bringing it up to date as well as in certain mechanical changes designed to make it more adaptable to efficient teaching.

ESSENTIALS OF PUBLIC HEALTH, by William P. Shepard, J. B. Lippincott Co., Philadelphia, Pa., $5.00.

614 RA425.S5 48-3841

Since it is a veritable mine of interesting and occasionally absolutely necessary information for the general public, but more especially for public officials, this volume should attract more than passing attentions. There is one omission that might well be noted. In the discussion of diabetes as a mortality factor, the author neglected to mention the danger many police and ambulance people run in assuming that every staggering pedestrian is under the influence of liquor. One has only to have a companion gradually relapse into a diabetic coma while walking to realize how similar the appearances are. There can not be too much public instruction on this point. Diabetics have died in jails and emergency hospitals because no one happened to be informed that they were victims of excess sugar or insulin, not excess "spiritus frumenti."

ESSENTIALS OF ZOOLOGY, by U. A. Hauber, Appleton - Century - Crafts, Inc., New York, N. Y., 35 West 32nd St., New York 1, N. Y., $4.00.

590 QL47.H3 49-7613

The author of this book is a Roman Catholic Monsignor and a Ph.D. from the University of Iowa. He has been in the collegiate teaching profession since 1914, and has spent several summers at the Marine Biological Laboratory. This is his second textbook. It follows the phyletic system from protozoa to humans, then considers the various organ systems. The book closes with discussion of geological and evolutionary theories, primitive man and the biological basis of human society. The last chapter on biological philosophies is a dispassionate presentation which does violence to no man's convictions but will help to keep some students thinking straight. There is a refreshing clarity about the illustrations, all of which are new and drawn especially for this work.

ESSENTIALS OF ZOOLOGY, by George Edwin Potter, C. V. Mosby Co., St. Louis, Mo., $4.50.

590 QL47.P59 48-7905

This second edition of the author's 1940 text has been to a large extent rewritten. It could have stood more accurate rewriting. The statement that "Mendel's immortal research was reported" in "an obscure Swiss paper" is a bit surprising. The periodical was "the Journal of Natural History" published by the Natural History Society of Brunn (Brno) in the Moravian part of Austria, now Czechoslovakia. Brunn is about 330 miles from the nearest point on the Swiss Border, in fact the whole of old Austria lies between Czechoslovakia and Switzerland. Some of the photographs leave much to be desired. At least in our copy, those of Linnaeus, Darwin, Pasteur and the *Trichinella* larva are definitely substandard presswork. This revised edition proves, however, that some zoology teachers are finding the text useful.

EXPLORING BIOLOGY, by Ella Thea Smith, Harcourt Brace and Co., Chicago, Ill., $3.28.

574 QH308.5.S6 43-5606

This is the most attractive High School biology text that has appeared for some time. It is worth considering by those who plan to do any high school teaching. The type format, illustrations, organization of matter, and presentation of the subject are superior to many college texts. This author knows her business.

FOREST INFLUENCES, by Joseph Kittridge, the McGraw-Hill Book Co., 330 West 42nd St., New York, N. Y., $4.50.

634.922 SD425.K55 Agr 48-34

This is a brand new book by the professor of forestry at the University of California. It is subtitled "The Effects of Woody Vegetation on Climate, Water and Soil, with Applications to the Conservation of Water and the Control of Floods and Erosion." In the fulfillment of that objective the author has turned out something more than a textbook of forest ecology. He has produced a well-documented reference manual which should be serviceable to all who are concerned with flood and erosion control, as well as timber production.

FOREST PROTECTION, by Ralph C. Hawley and Paul W. Stickel, John Wiley and Sons, Inc., New York, N. Y., $4.50.

634.96 SD411.H3 37-22654

This second edition of the 1937 volume from the joint pens of the professor of Silviculture at Yale and the assistant professor of forestry at the University of Massachusetts, was written as a classroom text to "equip the student with a well rounded knowledge of the whole problem of forest production in its relation to the growing of forests." A number of injurious rusts and blights are mentioned but somehow the phloem necrosis which bids fair to wipe out most of our American elms has not been mentioned,—possibly because there doesn't seem to be any protection against it.

FORESTRY IN THE SOUTH, by C. F. Korstian and Lee M. James, The Southern Association of Sicence and Industry, Parlor A, Hotel Murphy, Richmond 19, Va.

This well illustrated brochure is the first in a series of monographs on southern resources undertaken by the Institute for Research in Social Science of the University of North Carolina for the Southern Association of Science and Industry. It consists of two parts, "A Program of Forestry for the South," and "Forest Resources and Major Forest Industries of the South."

FUNDAMENTALS OF PHYSICAL SCIENCE, by Konrad Krauskopf, the McGraw-Hill Book Co., 330 West 42nd St., New York 18, N. Y., $4.50.

500 Q160.K7 48-4363

This is the second impression of the second edition of a college text by the associate professor of geology at Stanford University, first came into the market in May 1941. While this is not specifically a biological reference it does veer over into those fundaments which are essential to the deeper understanding of biological problems. Atomic structure is of importance nowadays in all walks of life. Radiant energy is fundamental not only in photosynthesis, but also in many important ecological relations. The chemistry of the carbon compounds is, of course, essential to all biology. As far as the weather, geology and the prehistory of the earth's inhabitants are concerned, this is a very handy one-volume reference work. Incidentally the mathematics of the science have been kept to a minimum.

FUNGI ANALYTICE DELINEATI, Vol. I, by A. Ceruti, G. Chiantore, Casa Editrice, Via Vittorio, Amedeo 18, Torino, Italy, $15.00.

QK603.C4 A48-10190

Here is a scholar's book. In fact it is not a book at all,—just a series of some 17 fascicles of printed matter (in Latin, English, French, Italian and German) and some 35 plates of the finest illustrations of fungi we have ever seen. The fascicles are not bound, but come in a protective casing all ready for your favorite binder.

GENERAL CYTOLOGY, by E. De Robertis, W. Nowinski, and F. Saez, The W. B. Saunders Co., West Washington Square, Philadelphia 5, Penna., $5.50.

Although it first appeared some time back in Argentina, this English text is virtually a new production. Although designed as a manual for advanced undergraduates it will not be beneath the notice of graduate students. The illustrations are new, clear and generous. The enthusiastic press notices it has received appear to be merited.

GROWTH OF PLANTS, by William Crocker, Reinhold Publishing Corp., 330 West 42nd St., New York, N. Y., $10.00.

581.134 QK745.C7 48-2197

This book is a critical summary of the basic research on plants carried on at the Boyce Thompson Institute from 1923 to the present. Since practically all this research is in the fields of plant physiology and horticulture those interested in these fields will be glad to discover the background of much of the research which has already been published.

HISTOPATHOLOGY OF IRRADIATION FROM EXTERNAL AND INTERNAL SOURCES, by Wm. Bloom, M.D., the McGraw-Hill Book Co., 330 West 42nd St., New York 18, N. Y., $8.00.

612.014482 RB27.B57 49-7487

Volume 221 in Division IV (The Plutonium Project) of the National Nuclear Energy Series, is an eye opener to those who are unawares of what is being done on nuclear research in this country. Here are 788 pages of technical report, nine pages of bibliography and a thirteen page index. It is profusely illustrated, sometimes in color. All the microtechnique is described and the irradiation dosages are presented so that any "Doubting Thomas" will be able to check the results of the irradiation which for each organ studied begins with total-body external treatment and then proceeds with the other external applications and those internally administered.

HUMAN ANCESTRY, by R. Ruggles Gates, Howard University Press, Cambridge 38, Mass., $7.50.

572 QH431.G343 48-5219

Dr. Gates's new book is the largest widescale study of human paleontology to appear in recent years. It contains a very thorough survey of all the major discoveries of prehistoric human remains from *Pithecanthropus erectus* in 1891 to the most recent finds. From the results of all these explorations Dr. Gates comes to the conclusion that no one (monophylitic) single strain is concerned in the establishment of the human race on the planet. Instead he postulates a polyphyletic origin for the human, deriving the various races from different lines of palontological ancestors. It is interesting to note that he utterly discounts sterility as the criterion of species.

HUMAN GEOGRAPHY, by C. L. White and G. T. Renner, Appleton-Century-Crafts Inc., 35 West 32nd St., New York 1, N. Y., $6.00.

910 GF33.W53 48-2862

The eminent position of the authors of this volume as professors of geography at Stanford and Columbia Universities respectively, makes their frank acceptance of geography as nothing more or less than an ecological study of human society a strong and appealing bid for our attentions. It is well illustrated, but there does not seem to be much stress on bibliography or outside reading.

HUNTING AMERICAN LIONS, by Frank C. Hibben, Thomas Y. Crowell Co., New York, New York, $3.75.

799.2774428 SK305.P8H5 48-8410

Most people do not realize that the cats once so common all over most of North America, are now confined to the more rugged terrain of our western mountain ranges, Central Mexico and the Everglades. This book tells the story of the author's field investigations for the Southwestern Conservation League. Big game hunters will be interested.

THE INSECT GUIDE, by Ralph B. Swain, the Blakiston Co., 1012 Walnut St., Philadelphia 5, Penna., $3.00.

595.7 QL467.S98 48-7228

This handy pocket manual comes as close to being a self-teacher of insect taxonomy as one could imagine. Inside the front and back covers is a handy key to order characters. Inside the book are some 450 well-drawn illustrations of which 330 are in full color. The author has not tried to present a complete taxonomic key to all the forms, but he does do a good job of the major Families and Orders.

INTRODUCTION TO BIOLOGICAL PRINCIPLES, by P. A. Meglitsch and J. P. Wessel, Burgess Publishing Co., 426 So. 6th St., Minneapolis 15, Minn., $4.00.

This is one of those spiral-bound notebook-sized lithoprinted manuals which are becoming so popular in dispensing with the more or less traditional laboratory drawings of varying degrees of accuracy and asthetic quality. The course covers one whole year's work in botany, physiology and zoology. There are a number of new and original experiments which ought to make student understanding of biology and its problems a lot easier.

INTRODUCTION TO COLOR, by Ralph M. Evans, John Wiley and Sons, Inc., New York, New York, $6.00.

535.6 QC495.E8 48-7620

Biologists who are interested in color photography of their research subjects for textbook illustrations, or just for the fun of it, will be well advised to buy or borrow this new work for the added information it has to offer to what has thus far been learned. The illustrations, many in color, are superb, the information is not too technical, accurate and clear, the bibliography entirely adequate.

INTRODUCTION TO GENETICS AND CYTOGENETICS, by Herbert Parkes Riley, John Wiley and Sons, Inc., 440 Fourth Ave., New York 16, N. Y., $5.00.

575.1 QH431.R63 48-5957

It is rather difficult to place this book. It aims to teach genetics by means of cytology, but at times one wonders whether the author isn't teaching cytology by means of genetics. In either case, it should be a good text for a well advanced class of biology majors with adequate background training. Graduate courses have been taught with poorer textual material.

INTRODUCTION TO ORGANIC AND BIOLOGICAL CHEMISTRY, by L. E. Arnow and H. C. Reitz, The C. V. Mosby Co., St. Louis, Mo., $5.75.

547 QD253.A7 43-4506

Divided into three parts, this work first devotes two chapters to a review of general chemistry, then treats organic chemistry through nineteen chapters, and offers a final eight to biological chemistry. In the second part it tries to correlate the products of modern chemical research into the discussion of pertinent subject matter. The third part covers enzymes, respiration, metabolism of the three types of foods, inorganics, hormones, vitamins and nutritional requirements.

ISLAND LIFE IN LAKE MICHIGAN, by Robert T. Hatt, and Others, Cranbrook Institute of Science, Bloomfield Hills, Michigan, $4.00.

596 QL628.M5H35 48-7777

This is a well written and attractively printed ecological survey of the islands along the northeastern shores of Lake Michigan, made under the cooperative auspices of the Cranbrook Institute and the University of Michigan. It is a long time since a freshly detailed study of inland island fauna has been available.

ISOTOPIC CARBON, by M. Calvin, C. Heidelberger, J. Reid, B. Talbert and P. Yankwich; John Wiley and Sons, Inc., 440 Fourth Ave., New York 16, N. Y., $5.50.

Those who are interested in the use of carbon isotopes as tracers in biological research will want this book. Its authors are all connected with the Radiation Laboratory, at the University of California at Berkeley. They contend that this book is so complete that it may even be used as a laboratory manual. The twelfth chapter is devoted to biosynthetic methods, and includes discussions of photosynthetic methods, plant materials (like starch, glucose from starch, fructose and sucrose), microbiological methods, as well as the butyric and caproic acids. There are nine appendices all concerned with laboratory techniques. It also contains nine pages of bibliography containing all published tracer applications of isotopic carbon up to recent times.

LABORATORY MANUAL OF COMPARATIVE VERTEBRATE EMBRYOLOGY, by A. J. Waterman, Henry Holt and Co., 257 Fourth Avenue, New York 10, N. Y., $3.50.

611.0139 QL957.W3 48-1436

Here is something more or less new in embryology textbooks. The fore part of the book, (up to page 225) gives a detailed but not verbose presentation of the fundamental problems of vertebrate embryology. These chapters are supplied with generous bibliographies and review questions. There is a short but very clear chapter on embryological techniques. The book closes with 60 pages of excellent photographs and photomicrographs on glossy paper.

LAMBERT'S HISTOLOGY, revised by HELEN L. DAWSON, The Blakiston Co., 1012 Walnut St., Philadelphia 5, Penna., $6.00.

611.018072 QM555.L255 48-11837

It is rare that a revision of a standard textbook merits or receives what might almost be called a luxury edition. The old "Introduction and Guide to the Study of Histology" was a well-known and highly esteemed manual. This new revision is worthy of investigation by those interested in human histology.

THE LEAFHOPPER OR CICADELLIDAE OF ILLINOIS, by D. M. DE LONG, Illinois Natural History Survey, 132 Natural Resources Building, Urban, Illinois, $1.25.

This taxonomic study begun in 1934 is well illustrated, and equipped with ten pages of very extensive bibliography. There are 514 illustrations,—most of them line drawings of insect parts.

LIFE, ITS NATURE AND ORIGIN, by JEROME ALEXANDER, Reinhold Publishing Corp., 330 West 42nd St., New York 18, N. Y., $5.00.

576 QH325.A45 48-5396

This is a delightfully casual group of concatenated essays ranging over all sorts of scientific and philisophical fields. Its author, a well known New York cossulting chemist and engineer, is evidently a man of wide culture and interests who elaborates here on his theme: "The most reasonable view, in the light of present knowledge, is that life began with the chance formation of a self producing unit of molecular or near-molecular complexity. In the process catalysis plays a tremendous part."

LIFE SCIENCE, by M. W. DE LAUBENFELS, Prentice-Hall, Inc., 70 Fifth Ave., New York 11, N. Y., $6.35.

574 QH308.D4 46-7287

This fourth printing of the third edition of a textbook which originally appeared in 1941 is, with its 1024 text figures and illustrations, probably the most profusely illustrated volume offered for use in biology classes today. The author who, is professor of biology in the University of Hawaii, has welded together into one unified sequence the traditional phyletic treatment of the plants and animals with the various biological fields into which the qualified student may wish to continue. Although offset printed in pica type the book is worth considering.

LIMNOLOGICAL METHODS, by PAUL S. WELCH, The Blackiston Company, 1012 Walnut St., Philadelphia 5, Penna., $7.

574.929 QH96.W39 48-9828

Limnology has been one of those subjects which, like the weather, everybody talked about it but nobody did anything about it. Here at last is a manual which covers hydrographic mapping, physical determinations, chemical and biological methods. The author's position as professor of Zoology at the University of Michigan should be assurance as to the authoritative status of the book.

THE MACHINERY OF THE BODY, by A. J. CARLSON and V. JOHNSON, University of Chicago Press, 5750 Ellis Ave., Chicago 37, Ill., $4.50.

612 QP34.C25 46-25734

This third edition has resulted from a thorough rewriting of this popular text in order to incorporate many suggestions received from users of the first two editions, as well as much which has come out of the medical research and physiological advances of the war years. So it is that newer knowledge of blood transfusions and use of blood banks, of nutrition and vitamins, of the use of radioactive elements, and the control of infections with the sulfa compounds and penicillin have been incorporated into the text.

MANUAL FOR LABORATORY WORK IN MAMMALIAN PHYSIOLOGY, by F. E. D'Amour and F. R. Blood, The University of Chicago Press, 5750 Ellis Ave., Chicago 32, Ill., $2.75.

612.072 QP44.D3 48-7189

Based entirely on the white rat and covering blood, heart and circulation, respiration, digestion and metabolism, excretion, nervous system, the endocrines and antibody formation, this unusual lab manual is worthy of any mannalean physiologist's attention. All the directors are superbly illustrated in the most beautiful laboratory photography that has yet been offered in the textbook market.

MATHEMATICAL METHODS FOR POPULATION GENETICS, by Gunnar Dahlberg, Interscience Publishers, Inc., 215 Fourth Ave., New York 3, N. Y., $4.50.

The head of the state institute of human genetics at Uppsala in Sweden here presents a survey of theoretical questions underlying the nature of populations from the point of view of heredity and based on the application of statistical and biometrical methods. It is not intended only for those who are interested in the mathematical evidences. It has much to offer all students of genetics. There are occasional sentences that make one think, as, for instance (p. 171): "It is interesting . . . to remember that the population in certain regions has been recruited primarily from emigrants from the lower classes of Europe, e.g., Australia and U.S.A., without any noticeable decline in quality being involved."

MICROBES MILITANT, by Frederick Eberson, The Ronald Press Co., 15 E. 26th St., New York 10, New York, $4.50.

616.01 QR56.E2 48-10875

Appearing seven years ago, just at the outbreak of the last world war as "The Microbe's Challenge," this volume is presented as the revised and newly titled version. The subject matter is much the same,—the microbe's challenge to our newest advances, meeting them with another kind of resistance. Those who were interested in biological or more specifically, bacteriological problems or the works of Paul De Kruif will find much similar material here, more dispassionately treated,—more light and less heat. Incidentally, this author devotes the better part of two pages to the bacteriological research of the same Paul de Kruif, who for the most of us was just another science publicist. Now it appears that he is or was a bona fide research man too.

MINERAL NUTRITION OF PLANTS AND ANIMALS, by Frank A. Gilbert, University of Oklahoma Press, Norman, Okla., $2.75.

581.13 QK867.G55 48-11835

This slim book of 131 pages first outlines the early history of plant nutrition, and then proceeds to discuss briefly the various essential elements and the results of their presence or absence in the development of plants and animals. There is a very up-to-date bibliography.

MIRROR FOR MAN, by Clyde Kluckhohn, Whittlesey House, McGraw-Hill Book Co., Inc., New York, 1949, $3.75.

572 GN27.K6 49-7012 rev.

The professor of anthropology at Harvard University "speaks right out in meeting" in this forthright book. Taking the long view of human behavior in all its various cultural manifestations the author has tried to find the L.C.D. of human relations. No wonder he was awarded the Science Fellowship award of $10,000 for this work. It is stimulating reading for every educated person.

NORTH AMERICAN TREES, by Richard Preston, Iowa tSate College Press, Ames, Iowa, $4.00.

582.16 QK481.P68 48-9052

Here is a new, slightly more than hip-pocket size field manual for the identification of North American trees that ought to go a long way to help popularize tree-study among a lot older people than Boy and Girl Scouts. There is an index of Latin and English generic and specific terms which runs over 1300 titles. There are some 160 pages of illustrations showing some 232 of the more important species, giving clear and easily recognizable drawings of stem, leaf, flower, and fruiting habits, as well as a distribution map of each type in the U.S.A. There is an introduction which gives some of the typical flower and leaf patterns and a glossary.

PLANT ECOLOGY, by W. B. McDougall, Lea & Febiger, Washington Square, Philadelphia 6, Penna., $4.00.

581.52 QK901.M3 49-919

This is the fourth thoroughly revised edition of a plant ecology textbook that has been becoming more and more of a classic in its field, ever since its initial appearance about twenty years ago. The book deals more with the ecological fundamentals than with specivc applications, the first 148 pages devoted to autecological factors and only about 60 to synecological matters. This is in line with the author's purpose to supply an informative text for elementary classes.

PRACTICAL BACTERIOLOGY, HEMATOLOGY AND PARASITOLOGY, by E. R. Stitt, P. W. Clough, and S. E. Branham, The Blakiston Company, 1012 Walnut St., Philadelphia 5, Penna., $10.00.

The recent death of the senior author, Rear Admiral Edward Rhodes Stitt, U.S.N. at the ripe age of 82 deprives American tropical medicine of one of its greatest figures. This tenth edition of one of the best known manuals in its field comes from the press with the collaboration of a number of eminent writers in special fields, and presents all types of laboratory procedures including clinical chemistry. In its almost 1000 pages one finds methods of identifying bacteria, filterable viruses, etc., as well as techniques for blood examinations, preparations of all sorts of cultural media, etc. There are keys to almost all the usual and some exotic blood parasites. Finally there are quite a number of clinical and pathological examinations of the body fluids and organs.

PROCEDURE IN TAXONOMY, by E. T. Schenk and J. H. McMasters, Stanford University Press, Stanford, Calif., $2.50.

A. M. Keen and S. W. Muller have revised the 1932 original of this 93-page book and brought it into harmony with the latest *opinions* rendered in accordance with the International Code of Zoological nomenclature. It covers the various systematic categories, the problem of types, and the storage of type material, specific and trivial names and synonymy. The description of a new species is succinctly treated. The appendix covers a number of allied problems, not the least of which are the law of priority and the code of taxonomic ethics.

RACIAL VARIATIONS IN IMMUNITY TO SYPHILIS, by C. N. Frazier and Li Hung-Chiung, The University of Chicago Press, 5750 Ellis Ave., Chicago 37, Ill., $2.50.

616.951 RC201.F82 48-3840

This monograph is the report of the analysis of 16,845 cases of syphilis in Chinese, Negro and White people, emphasizing the common basic design of the disease in the human species, and discrediting the theory that there are existing strains of the causive organism which determine the localization of syphilis in the nervous system.

RADIOACTIVE INDICATORS, by George Hevesey, Interscience Publishers, Inc., 215 Fourth Avenue, New York 3, N. Y., $10.00.

574.1072 QH505.H4 48-8866

Those who are interested in the use of tracers in animals will welcome this large work by the initiator of the method of using radioactive substances in biochemical, pathological and medical research. Detailed techniques, results, possibilities and limitations in the use of different tracers are offered.

RAINFALL AND RUNOFF, by Edgar E. Foster, The Macmillan Company, 60 Fifth Ave., New York, New York, $9.00.

551.57 QC925.F6 48-4364

The author who is senior engineer with the U. S. Bureau of Reclamation at the Denver Federal Center, has worked on hydrologic projects for over 25 years. Here he presents a scientific exposition of the principles and methods underlying water supply, flood control, irrigation, drainage, etc., the book covers in a highly technical manner the field of hydrology, atmospheric moisture, and precipitation, air masses, storms, distribution and frequency of precipitation, snow, evaporation, runoff, floods, ground water and the utilization of hydrologic data. These matters are not popularly presented. This is a valuable book for those whose training renders them competent to understand and interpret the data presented.

READINGS IN BIOLOGICAL SCIENCE, edited by I. W. Knobloch, Appleton-Century-Crafts, Inc., 35 West 32nd St., New York 1, N. Y., $3.00.

574.082 QH302.K58 48-3032

Other subjects in the collegiate curriculum have their surveys of outstanding authors to be read in part for their syle, thought, or merely as indicators of the development of the field being studied. It remained for Dr. Knobloch to be the first to present to modern readers such a survey of biological literature. Since this is the first attempt of any magnitude along this line, it will probably not suit the tastes of all who read it. For instance, there are only five pre-Darwinian authors cited, and the moderns who are quoted range very unevenly from true scientists like Thomas Hunt Morgan and Anton J. Carlson all the way down to newspaper men. There are no scientific papers included in it. All the selections are *about* biological personages, subjects or movements. Nevertheless it is a valuable addition to the library.

SMALL FRUIT CULTURE, by J. S. Shoemaker, the Blakiston Co., 1012 Walnut St., Philadelphia 5, Penna., $4.00.

634.7 SB355.S58 Agr 48-361

This is the second and thoroughly revised edition of a work which originally appeared in 1934. It covers the culture of grapes, strawberries, bramble-fruits, currants and gooseberries, blueberries and cranberries. It well merits its subtitle: "a text for instruction and reference work and a guide for field practice."

THE SONGS OF INSECTS, by George W. Pierce, Harvard University Press, Cambridge 38, Mass., $5.00.

595.7 QL597.P5 48-3073

The results of twelve years of research by Dr. Pierce, who applied physical methods and apparatus to insects are here recorded. The groups studied include crickets, katydids, locusts and cicadas. There is also a chapter on the songs of a few birds,—the chipping, song and vesper sparrows, the warbling vireos and,—of all things, bats. The latter are found to emit a supersonic cry of about 48,000 cycles in addition to their usual squeaks which have a frequency of about 7500 cycles per second. The differential echoes from other objects in the path of the bats saves them from collisions. The account of the recording equipment will interest physicists, acoustical experts and radio people as well as entomologists and other biologists. This research recalls another non-biologist, Dr. E. B. Frost, late director of Yerkes observatory who first announced the relation between atmospheric temperature and the frequency of cricket chirps. This book will no doubt appear as a total surprise to the already large number of the nation's leading communications engineers and physicists who have come to respect the versatile author in his position as Professor of Physics at Harvard University.

SOURCE BOOK IN GREEK SCIENCE, by Morris R. Cohen and F. E. Drabkin, McGraw-Hill Book Company, 330 West 42nd St., New York 18, N. Y., $9.00.

508.2 Q151.C65 48-9579

This is a thoroughly scholarly work offering many selections which have hitherto been available only in the original Greek or Latin. The book covers the fields of Mathematics, astronomy, mathematical geography, physics, chemistry, geology and meterology as well as biology and medicine. Those on biological subjects include such revealing and trenchant paragraphs as Aristotle on animals and plants, the classification of animals, membranes, bones, the stomach of ruminants, generation and embryology, the development of the chick, habits of animals (illustrated by bees, angler fish and the torpedo) and animal diseases. Theophrastus is quoted on plant organography, roots and flowers, plant classification, germination and growth, grafting and budding, ecology, plant pathology and the diseases of cereals and pulses. This is definitely a book which ought to be in every college biology library.

SPIDERS OF CONNECTICUT, by B. J. KASTON, Connecticut Geological and Natural History Survey, Connecticut State Library, Hartford, Conn., $6.00.

595.44 QL457.1.K3 GS 48-35

The associate professor of biology at Teacher's College of Connecticut here presents an 874 page monograph, with 2144 illustrations, which includes several forms not native to the state but which have appeared from time to time in nearby states. There is a bibliography of some twenty-five pages, and the 17 page index lists over two thousand titles.

THE STUDY OF PLANT COMMUNITIES, by HENRY J. OOSTING, W. H. Freedman and Co., 549 Market St., San Francisco 5, Calif., $4.50.

581.5 QK901.06 48-4443

The plan of this book embraces the nature and methods of approach to the plant community, environmental factors controlling the community, community dynamics and applied ecology in forestry, range management, agriculture, conservation, landscaping, plant indicators and human ecology. There are 190 definitely better-than-most illustrations, almost all of them new. There are suggested topical readings at the end of each chapter and a bibliography of some 276 pertinent titles.

THE TANKS ARE COMING, by EARLE A. SPESSARD, Hydroponics, Inc., P. O. Box 191, Little Rock, Ark., $3.50.

The professor of biology at Hendrix College has prepared this little manual for those who are interested in hydroponics for profit or for fun. The directions are so clear and the illustrations so helpful that those who use them should be assured of success.

TEXTBOOK OF ENTOMOLOGY, by H. H. ROSS, John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y., $6.00.

595.7 QL463.R68 48-10503

The author of this entirely new work is the professor of entomology at the University of Illinois, as well as systematic entomologist of the Illinois State Natural History Survey. His book is illustrated with some 434 drawings and photographs. In it he aims to bring together all the fundamental aspects of entomology, so organized that students will get a general idea of the entire field. This has meant the sacrifice of some detailed information in order to emphasize basic principles,—the relationship of the subject to other biological fields, notably ecology and physiology.

VETERINARY PROTOZOOLOGY, by BANNER BILL MORGAN and PHILIP A. HAWKINS, Burgess Publishing Co., 426 South Sixth St., Minneapolis 15, Minn., $4.00.

636.0896961 QR251.M7 48-3328

This first complete text on the protozoa of domestic animals is the initial work of two associate professors at the University of Wisconsin and Michigan respectively. The large thin book is done in photo offset, very clearly and distinctly. This is particularly true of the 25 pages of illustrations. The chapters are unique in arrangement, following not the customary phyletic fashion of most textbooks but divided up on the basis of host animals. The horse, cattle, sheep and goats, swine, dog and cat, poultry and finally fur bearers. The concluding chapter on diagnosis of protozoan infections is in effect a brief manual of lab techniques.

THE WAYS OF FISHES, by L. P. SCHULTZ and E. M. STERN, D. Van Nostrand Inc., 250 Fourth Ave., New York 3, N. Y., $4.00.

597 QL639.S36 Agr 48-209

The senior author of this interesting work is none less than the distinguished curator of fishes at the Smithsonian Institution, U. S. National Museum. In it he has gathered all the information on the behavior of fish, wildly impossible as some of it seems to be. This information is presented in an informal style, with many excellent line drawings to illustrate it. There is no bibliography, probably because this informative book was written for pleasant reading and not to gain scientific honors. There is a good index.

WILDLIFE MANAGEMENT, by R. E. Trippensee, McGraw-Hill Book Co., 330 W. 42nd St., New York 18, N. Y., $5.00.

799 SK353.T75 Agr 48-285

The professor of wild life management in the department of forestry and wild life management at the University of Massachusetts here presents a textbook in a field of growing importance in the recreational and conservational aspects of American life. This book was originally written as one volume containing sections on upland game, general principles of management, fur bearers, waterfowl and game fishes. The volume proved too large so the material was broken down into two parts the first of which is devoted to upland game and general management. Those who like this book either as a class text or as a field manual will be anxious for the publication of the rest of the work.

ZINSSER'S TEXTBOOK OF BACTERIOLOGY, by D. T. Smith and D. S. Martin, Appleton-Century-Crafts Inc., 35 West 32nd St., New York 1, N. Y., $10.00.

616.01 QR46.Z5 48-8454

This is the Hiss and Zinseer manual of 1910 and many subsequent editions and revisions brought up to date by seven members of the Duke University School of Medicine. The original plan has been maintained for skeletal purposes. The seventy-seven chapters of the book are apportioned under the following nine sections,—biology of bacteria, infection and immunity, patholenic microorganisms, spirachetes, rickettsias and rukettsioses, filterable virus diseases, medical mycology, and technical methods of bacteriology, immunology and secology. Each chapter has its own bibliography of references, and there are thirty-nine two columned pages to the index.

Colleges Too Much Concerned with Facts

Readers of Arnold Toynbee's deservedly popular *Study of History* have noticed his frequent references to a phenomenon he calls "Withdrawal and Return." According to Toynbee, advance has sometimes been made by withdrawal for reflection and criticism and later return to greater social usefulness . . . Colleges of liberal arts have never found it difficult to withdraw; it is the successful return that has given them trouble. They have sought detachment for the sake of understanding but too often they have used it as an excuse for evading the responsibilities of decision and action . . .

Today's difficulties are forcing all colleges to ask themselves why this division has been allowed to persist. There seem to be three main reasons. First, our teaching has been concerned with facts and has paid too little attention to the attitudes by which facts are made to serve life's purposes. The truth is, of course, that attitudes determine our use of facts. If, for instance, students have the attitude of curiosity they will learn the facts for themselves. If they have honesty they will be ruthlessly critical. If they have loyalty they will work out a constructive point of view. And if they have love they will not let an idea go until its implications for society are revealed.

In the next place we have lost the larger, over-all view. The great teachers of fifty years or so ago, whom we call the Olympians, taught philosophy and other subjects for the light they could throw on the conduct of life.

In the third place, I believe we should take account of a special occupational disease which sometimes infects a college community. The mastery of a difficult intellectual problem often seems to bring a feeling of contentment which passes easily into indifference not only to what is outside one's field but to one's own shortcomings in this field or any other.—From Report of President Julius Seelye Bixler, Colby College.

PHI SIGMA SOCIETY NEWS

Convention Summary

The twelfth general Meeting of Phi Sigma was held on the campus of the University of New Mexico, Albuquerque, New Mexico, Tuesday through Thursday, 28-29-30 December 1948. In many respects it was unique. That it marked another milestone in the history of our biological society goes without saying. Many of the actions which transpired during the sessions had much farther reaching repercussions than any of those who attended could possibly have suspected.

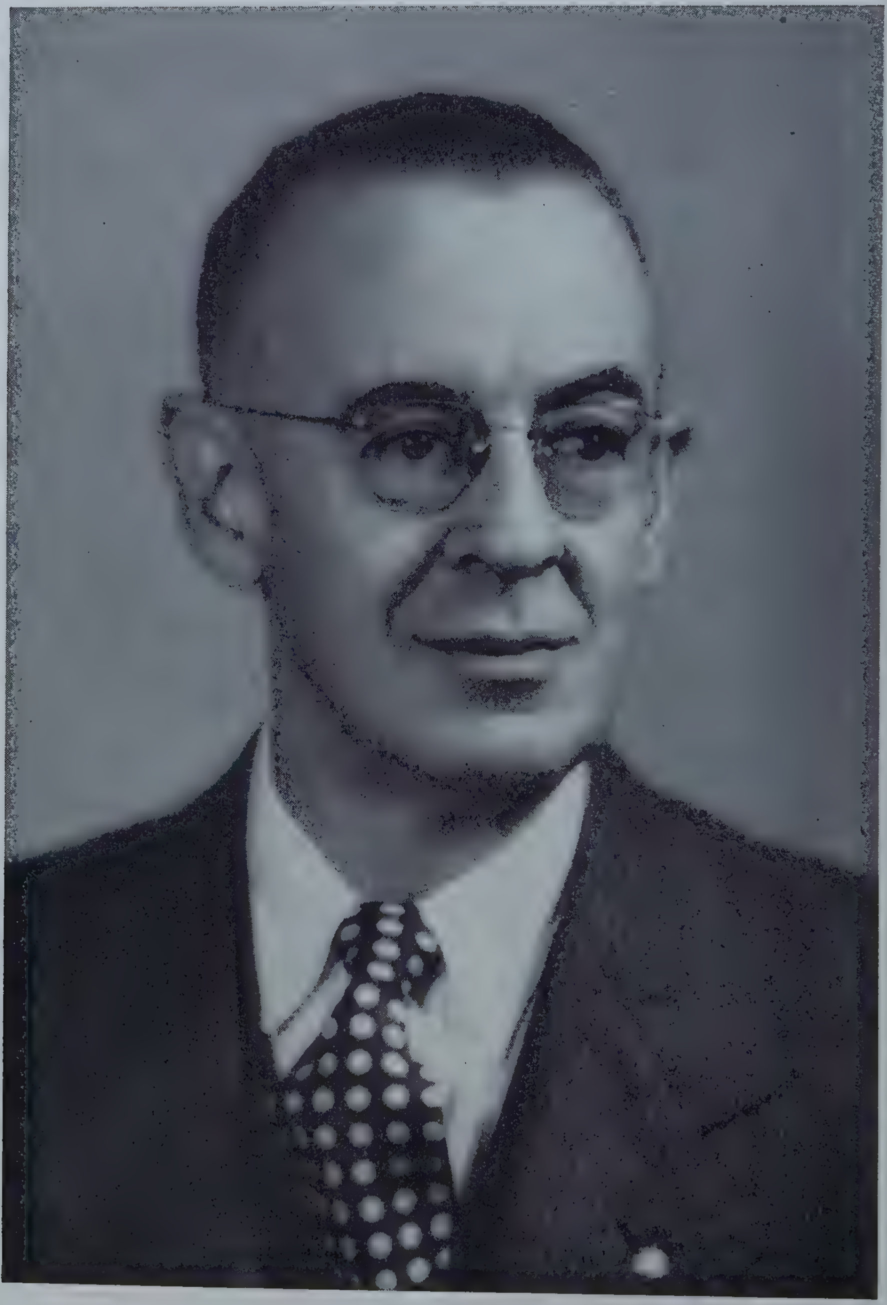
Previous to the opening session on Tuesday evening, December 28th, the Council met in a preliminary session to check on all convention details so that the meeting could run smoothly and efficiently. With regret the Officers of the Council read the notice from Dr. Richard B. Goldschmidt that a sudden and serious illness of his wife would prevent his being in attendance. Accompanying his letter was the text of the speech that he had intended to give at the convention banquet and an abstract of the same. It was decided after some discussion that no one had the right to present the presidential address in the absence of its author, and that the Editor would be called upon during the sessions to read the abstract to the delegates and then publish the speech in full on THE BIOLOGIST. Dr. Keefe carried out these details as instructed. However, the content of Dr. Goldschmidt's paper was so unusual and challenging that the Editor took it upon himself to accept the kind offices of Dr. Castetter, Faculty Adviser of the host chapter, and have Dr. Goldschmidt's text immediately copied and forwarded by air mail to SCIENCE SERVICE in Washington, D. C. Immediately upon receipt of Dr. Goldschmidt's paper, the Editor was advised that the paper was much too important to be published only in the fraternity magazine. Another copy was, therefore, forwarded to the editor of SCIENCE and after some rewriting by Dr. Goldschmidt, was published in that magazine in the issue of 4 March 1949, Volume 109, pages 219-227. In accordance with a promise made at the general meeting, the revised paper is reprinted here in this issue with the permission of the Editor of SCIENCE.

First Session

The delegates and the Council assembled at 8:00 p.m., 28 December 1948, for their organization meeting in the spacious lounge of the University of New Mexico Student Union. Dr. E. L. Castetter, Head of the Department of Biology at the University of New Mexico, first officially welcomed the members of the Council and all the delegates and alternates to the campus and to the city of Albuquerque.

Dr. Ortenburger, temporary Chancellor, presided. After the introduction of the various Council members to the delegates, the presiding officer announced the appointment of the following committees:

1. Resolutions: Carter (Nu) (Chairman), Baird (Kappa), Brotherton (A. Eta), Haynes (Lambda). Meeting with Lagler.
2. Reactivation and Expansion: Bowman (A. Phi) (Chairman), Brennan (Rho), Rieck (Omicron). Meeting with Lagler.
3. Credentials: Stewart (Treasurer) (Chairman), Dowell (A. Upsilon), Herring (Sigma), Johnston (Beta).
4. Constitutional Amendments: Leech (A. Sigma) (Chairman), Gordon (A. Nu), Jones-Burdick (A. Pi), Korn (A. Kappa). Meeting with Keefe.
5. Auditing: Stimpfling (Epsilon) (Chairman), Anderson (Chi), Ibarra Urrea (A. Tau). Meeting with Stewart.
6. Nominating: Brandt (A. Alpha) (Chairman), Bias (Omega), Guest (Pi), Walker (A. Mu). Meeting with Stewart.
7. Biologist: Dr. Freedman (A. Epsilon) (Chairman), Anderson (A.



DR. ARTHUR I. ORTENBURGER, University of Oklahoma
Chancellor of Phi Sigma Society

Xi), Baker (Eta), Brummett (A. Rho), and Doan (Upsilon). Meeting with Keefe.

A recess was declared while the Credentials Committee checked the certificates of all delegates and alternates present. Upon resumption of activities the report of the Committee was received and accepted and a roll call of all delegates and alternates followed. Each chapter delegate gave a brief report on the local activities which ran as follows:

Beta: Group recently fostered a photographic exhibit of natural history subjects. There were sixty entries; the show lasted one week and was well received.

Epsilon: Made a number of successful field trips in a region which lends itself well to such activities. There are plans for more trips into the mountains to study the plant and animal life. In this chapter Zoology, Botany and Anthropology are the main interests.

Eta: There are twenty members in this chapter. Initiation is planned in February.

Kappa: Meetings are held regularly. Initiation took place in December. The members of this chapter are scattered widely in several units so that attendance tends to be somewhat irregular. The Museum group is being brought into the Society more recently. Discussion centers mainly in the fields of Entomology, Zoology and Botany.

Lambda: The activities of this chapter has recently centered in the reactivation of the Biological Station. Trips were made especially to show students the possibilities for constructive work there.

Nu: Programs are held alternate weeks. Students take part for two months and then speakers are invited from other institutions. Field trips are planned. Films are shown which cover the field of Biology as a whole.

Pi: A large group were recently initiated. Seminars have been held in which professors show students some of the possibilities in the field of Biology.

Rho: There has been some difficulty in this group getting the Ph.D. trained individuals to come to the meetings. The best program seems to center around a symposium. Programs of this kind were held in Human Biology, Human Intelligence, etc.

Sigma: This group is becoming quite active. Difficulty seems to come from wide interests since members come from fields as varied as the following: Agriculture, Bacteriology, Zoology, Botany, etc. Programs include speakers each month and some good programs were arranged. For example, one program included films on the life history of flies.

Upsilon: At present there is a large group participating in this chapter. A desire for field trips has been expressed and such trips are being planned. Recently this chapter enjoyed a very interesting talk on the great western parks. There are a number of good speakers available because of the many schools that are located near to Oxford. Symposia are held by students who discuss their special interests.

Chi: Meetings are held every two weeks and the speakers are usually other than faculty personnel. Lectures on the origin of scientific terms are being planned for next spring. Field trips will also be held when weather permits.

Psi: Two meetings are held per year and an effort is made to get good speakers.

Omega: At an activities meeting pledges are asked to present something of interest. This arrangement is designed to encourage beginners. The regular members also report on activities in research.

A. Alpha: New faculty members have been taken into the Society and these men speak at the monthly meetings. In this arrangement students get better acquainted with new faculty members.

A. Epsilon: Meetings are held once a month, usually with an outside speaker with wide interests. These men vary from chemists to physicians. Combined meetings are held with a group in social industrial hygiene. Socials are held to improve the social relations of the chapter members. Field trips are planned, and in this arrangement a trip to the local observatory is included.

A. Eta: This is a large chapter. Faculty are invited to give talks, and speakers from outside the campus are also invited. A recent lecture dealing with viruses was of particular interest.

A. Kappa: This chapter has speakers who introduce a wide variety of subjects. Such subjects as blood transfusion, osteopathy, etc. are discussed. Of special interest was a lecture on ants by one of the curators in the Museum of Natural History. At present a project dealing with new stains for protozoans is being planned. Men are now attending Hunter College and are being initiated into Phi Sigma for the first time in the history of this school.

A. Mu: Reactivation seems to be needed in this chapter. Good speakers are being invited. Student participation is provided by having them talk about their research. Students take part in at least one meeting each semester. The faculty are also requested to participate.

A. Nu: A larger group than usual was recently initiated, and consequently more activity can be anticipated. Student members have been asked to discuss their own work. Guest lectures sponsored by Sigma Xi were heard.

A. Xi: A conference of Biology teachers who brought many interesting exhibits was held. Two meetings are held each month. This chapter submitted the following detailed report: 1. Cell—the organ of Alpha Xi. 2. New England Conference at M.I.T. where problems being investigated are reported. 3. An open meeting once a month and to date there was a forum for undergraduates at which Dr. Hartung reported on "Tumors in *Drosophila*." 4. Plan to have Dr. Waxman in collaboration with Sigma Xi in January. 5. A contest with the Univ. of Connecticut Biology Club during the spring term for collecting and identifying the flora and fauna of a selected ecological niche. 6. Plan to help reopen the Narragansett Marine Laboratory. 7. One graduate student from each department is encouraged to work on problems in the biology of Tucker Pond in South Kingston. Such a study now in progress on the mosses.

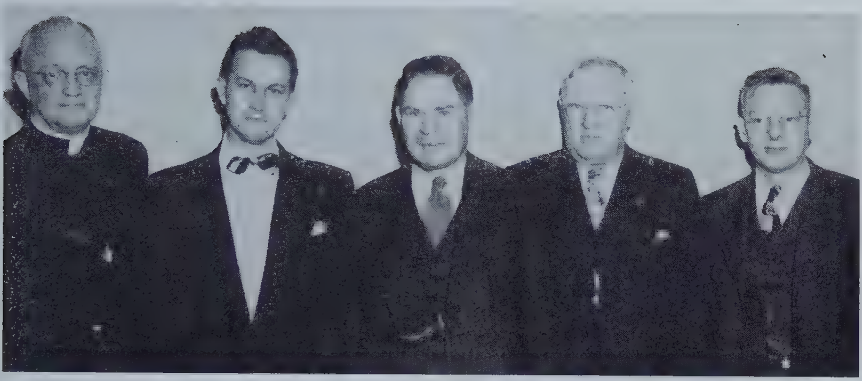
A. Omicron: Meetings once a month with student participation. There has been good response to a lecture series held on Sunday afternoons especially for the University as a whole. Demonstration meetings have proven very popular. Such occasions permit the demonstration of results attained in various kinds of research. This arrangement has proven so successful that an attempt will be made to expand it.

A. Pi: Only fifteen members in this chapter but reactivation seems to have begun. Sponsor outside lectures in an effort to get the school as a whole interested in the field of Biology. This chapter needs such advertising on this campus because there seems to be a problem involving methods for attracting students to the field.

A. Rho: The membership of this chapter indicates considerable growth. Several faculty members have been helpful in organizing the programs. Student participation is planned. There are plans to take in an outstanding student from another campus in the region. Such a candidate would be recommended by one of the major professors there.

A. Sigma: A group in this chapter spent considerable time considering the agenda for the National Meeting. A healthy sign is the addition of twenty-five new members recently. Two meetings are held each month at one of which there is an outside speaker. At other meetings there are student reports and seminars. Sigma Xi also invites Phi Sigma to meet with them. Some good faculty sponsors have done much for this chapter. Plans are to take in an outstanding sophomore each semester.

A. Tau: Work of chapter greatly hampered because of the way the school is scattered not only in different parts of the city but even in different cities. There is really no undergraduate group. Members are all graduate students mainly in the fields of Medicine, Anthropology, Biological Chemistry, etc. Actually it is quite difficult to get this widely scattered and diversified group together. Since Phi Sigma is very new in Mexico and since such an organization is quite unfamiliar to the people there, Phi Sigma must strive to have it accepted by the people. Special efforts have been exerted to get the aims of the Society to the students and the faculty. After several years of



1948 CONVENTION OFFICIALS

(Left to right) A. M. Keefe, Biologist Editor; Karl F. Lagler, Vice-Chancellor; E. F. Castetter, Chairman, Biology Department, University of New Mexico; E. H. Stewart, Treasurer; Henry van der Schalie, Secretary.

sponsorship it appears as though better progress will be made this year. The Greek letters are gradually being accepted and it begins to look as though Phi Sigma is going to be a growing concern.

A. Upsilon: A dinner dance is usually held for the new initiates in the fall. In the spring the group goes to a tide pool to hold a beer bust. The delegate vouched for the fact that: "This arrangement attracts a lot of member." One must remember that *A. Alpha* members are the across town rivals. The speakers at the meetings are usually assistants, teaching fellows, etc. At one meeting each month there is a guest speaker which relieves the students from participation. There is a good selection of speakers available in this region.

A. Phi: The organization of this chapter is quite recent so that in some ways the group is still somewhat in the organization period. The programs are usually monthly with a guest speaker. Field trips are planned for spring. This chapter is interested especially in some of the foregoing program suggestions.

Following the report of the Chapter delegates the Chair asked if there were any other committees to be appointed. After some discussion the session was adjourned to give the committees a chance to meet.

Second Session

The Wednesday morning session opened at 9:00 a. m. with reports from the Council Officers. The Secretary, Dr. Henry van der Schalie, reported on his activities since assuming the duties of Secretary pro tem at the West De Pere meeting the 9th and 10th of September. This report was followed by one from the Treasurer, and the acceptance of the Auditing Committee's report. The Chair then asked the Vice Chancellor to take over the meeting with the report of the Nominating Committee for the election of a new Chancellor and Secretary. After Dr. Ortenburger and Dr. Henry van der Schalie retired from the room, this report was read. After some discussion Alpha Alpha moved the report be accepted and Beta seconded. The motion was passed unanimously and the Chair declared Dr. A. I. Ortenburger elected Chancellor, and Dr. Henry van der Schalie elected Secretary, for the ensuing four years. The newly elected officers were recalled to the chamber with applause and business was immediately resumed. In view of the fact that more than three-fourths of the Chapters had voted in favor of accepting the University of the Philippines into Phi Sigma, there was no further action needed. The next item was a discussion of the problem presented by the Honor's Convocation and the Eligibility Award. A considerable length of time was devoted to discussion on the advisability of changing the present type of award. It was finally decided that in lieu of the present medallion, a certificate should be given as a biology award on the various Phi Sigma campuses. The next discussion had to deal with initiation fees. It was finally moved that the Council Treasurer would give each Chapter a report on the status of the Society's finances every six months.

Third Session

The afternoon of Wednesday, 29 December, was devoted to the presentation of scientific papers. As has been customary in previous sessions of this type, the Vice Chancellor occupied the Chair. Abstracts of these papers are published elsewhere in this issue of THE BIOLOGIST. One small item of business was taken up in the absence of the Council Chancellor—That was a motion by Alpha Epsilon, which was seconded by Alpha Upsilon, that the Society present Dr. Ortenburger with a gift in appreciation for his many years of service as the National Secretary. Upon suggestion by Omega that a desk set would be appropriate, the motion was carried unanimously and the delegates from Omega and Alpha Eta were asked to select the gift which was to be presented at the Banquet on Thursday evening.

The members of the Council were the guests of Dr. and Mrs. E. F. Castetter at a cocktail party at 5:00 p.m. in their home in Albuquerque in order to meet Dr. Tom L. Popejoy, President of the University of New Mexico. One other guest was present, Dr. John M. Cooper, Professor of Anthropology at the Catholic University of America, Washington, D. C., who was first semester Visiting Professor at the University of New Mexico.

Fourth Session

At the opening of the 8:00 p.m. session, 29 December, the Chancellor called attention to the splendid arrangements for this meeting which had been made by the local committee. A vocal expression of appreciation was given to Dr. Castetter and the members of the Biology Staff, to Mr. Larry Gordon and the members of Alpha Nu Chapter at New Mexico University. The Editor of THE BIOLOGIST was then asked to read the abstract of Dr. Richard Goldschmidt's paper.

In the report of the Resolutions Committee there were formal resolutions of gratitude to the University of New Mexico and the Department of Biology for their hospitality,—to Dr. Richard Goldschmidt, to Dr. A. I. Ortenburger, and to Dr. Paul A. Warren, past Chancellor of the Society. These resolutions were all accepted unanimously. The second part of the Resolutions Committee report called attention to the fact that Phi Sigma was committed by its Constitution to meet alternate years with the American Association for the Advancement of Science. It was suggested that in view of the changing policy of the A.A.A.S., it might be wise for our Fraternity to hold its meetings on the campus of the member schools or at least to leave the Council some leaway in choosing a meeting place. The matter was turned over to the Committee on Constitutional Amendments. It was unanimously decided that discussion on further reports be limited to thirty minutes.

The Committee on Reactivation and Expansion submitted the following nine-point program:

1. The question of number versus the quality in number was discussed. It was pointed out that a large membership would benefit our Society financially. Generally it would be desirable that a chapter grow to the maximum of its capacity.
2. The first question considered was how to activate an active chapter so that reactivation at some future date would be unnecessary. The value of Chapter activities as reported previously by the chapter delegates such as: photographic displays, field trips, biological open house, films, etc., would be helpful in aiding some chapters in planning their own activities. It is recommended that the Council include the information given during the first session of these meetings in the Secretary's Report (see Chapter Delegate Reports).
3. The importance of choosing the right kind of faculty sponsor (or sometimes called Council Representative) and of fixing a responsibility for aiding the chapter upon him

was particularly stressed. Such an arrangement would be an insurance against chapter slumps and the future need for reactivation of a chapter.

4. The sponsor should serve as a means of keeping a permanent record of the chapter files including a complete list of the members and minutes of past meetings and as a permanent mailing address for the chapter. In most cases the sponsor is elected but it would be best if his office is not too frequently changed. One delegate suggested it would be a good policy to have two sponsors whose terms would be staggered.
   Direct correspondence among chapters was considered of particular value in holding the interest of members. A mimeographed list of officers sent out as soon as they are elected was thought to be better than waiting till they appeared in the next issue of THE BIOLOGIST.
5. The importance of holding the interest of the alumni as well as that of present members was stressed: (a) for the purpose of creating an interest in Phi Sigma in colleges and universities which have no chapter, and (b) as a means of augmenting income. One suggestion was that the initiation fee cover only a temporary (possibly 3 to 5 year) subscription to THE BIOLOGIST and that future issues be paid for at an annual rate. (a) In preparing this list the forthcoming *American Men of Science* volume will be of use. A list could be prepared of those giving Phi Sigma as one of the societies to which they belong. (b) The advisability of setting up a fund to make such a list was considered. (c) A letter sent out by the local chapters giving news of alumni by year of graduation is suggested as a means of retaining the interest of active and alumni members. (d) Running advertisements in Science to contact alumni.
6. The committee recognized that THE BIOLOGIST could be the most binding and stimulating factor in the Society. THE BIOLOGIST could be sent to key members of a faculty where the Society would be interested in establishing a chapter.
7. The following constitutional amendment is recommended:

   "Each chapter will appoint a chapter editor to contribute information about interesting meetings, new officers, and any material called for by the National Editor in the way of manuscripts for feature articles."

   (2) Secure publicity through chapter and conventions, exhibits, etc.
8. Also recognize the desirability of having a larger reserve fund. The present fund is $2,000 which is sufficient to operate as long as things go smoothly but it could not carry the Society over a rough period.
   Discussion revealed that the failure of chapters to function smoothly or even at all is often due to: (1) undesirable members, and (2) undesirable sponsors. Both of these situations usually iron out in time so that it is of great importance to rejuvenate chapters suffering from a lack of activity.
9. The following suggestion was made: to fix upon each chapter by action of this convention the charge that it achieve one reactivation or one new chapter between now and the next convention.

Alpha Alpha moved the acceptance of the report. Alpha Omicron seconded; Alpha Epsilon amended in favor of distributing the foregoing to all Chapters, but the Chairman stated this amendment was not necessary. The motion was carried unanimously. After further discussion of points suggested out of the preceding report, it was moved by Omega, seconded by Alpha Alpha that Phi Sigma petition for admission in the Association of College Honor Societies. After a short discussion the motion was carried unanimously. Alpha Upsilon moved that by proclamation Phi Sigma now consider itself on *Honor Society*. This was seconded by Alpha Mu and the motion carried.

The report of the Committee on Constitutional Amendments was read in full and discussed point by point. Since new Constitutions will be printed and distributed to all the Chapters the revisions of the Constitution will not be reported in this issue. At 10:00 p.m. the Chair declared a ten minute recess.

The closing half of the last session of the Meeting resumed work at 10:12 p.m. with an invitation from the Chapter at the University of California, Los Angeles, to hold the 1951 meeting there. Appreciation for the invitation was expressed by the Chancellor and the matter was taken under consideration until other chapters could be heard from.

The report of the Committee on THE BIOLOGIST was read by Alpha Epsilon which also moved the acceptance of the committee report with the provision that it be mailed to all the chapters. Beta seconded the motion and it was carried unanimously. It was suggested by the Editor that information on any suggestion of general interest to the chapters such as desirable films for use in class or meetings should be forwarded to the Editor for publication in THE BIOLOGIST. The last business taken up by the delegates arose out of the question of reactivation of inactive chapters. There was some discussion, but no further action taken. Alpha Sigma moved that the Meeting adjourn and it was so agreed at 10:35 p.m.

Santa Fe Trip

Promptly at 8:00 Thursday morning the members of the Council, chapter delegates and alternates gathered at the New Mexico University Student Union, were picked up by the University bus and several private cars for a tour through Albuquerque and a sightseeing trip to Santa Fe. Upon arrival in that city, headquarters were established at the beautiful La Fonda Hotel where an early luncheon was enjoyed. Several of the delegates had their first taste of typical Mexican foods; others were not so courageous and stuck to more prosaic American fare. Following the luncheon, the whole party moved to the Cathedral of Santa Fe, parts of which date back to the eighteenth century and the days of the Spanish Padres.

Following the visit to the Cathedral, the group visited the Spanish Governor's Palace where General Lew Wallace wrote *Ben Hur*. This is now completely taken over by the State Historical Society Museum. The beautiful new art gallery and St. Francis Hall which is part of it were next visited. Many pictures were taken in the patio of the building. The last visit was to the very ancient Church of San Miguel which is one of the oldest extant edifices in the Southwest, dating back into the seventeenth century. The party then returned to Albuquerque for the last big event of the Convention.

Convention Banquet

The closing event of the 1948 Meetings was a banquet in the Indian Room of the Franciscan Hotel in Albuquerque. The list of those who attended with their addresses is presented herewith in the order in which they sat at the tables:

Jack Stimpfling, 950 Navajo St., Denver 4, Colo.

Howard R. Bowman, Todd Hall, College of Puget Sound, Tacoma, Wash.

Charles D. Haynes, Jr., Dept. of Zoology, Montana State University, Missoula, Mont.

P. M. Johnston, Dept. of Zoology, University of Michigan, Ann Arbor, Mich.

Margaret L. Gilbert, Rhode Island State College, Kingston, Rhode Island.

Bernice C. Anderson, 80 Rogers Ave., Riverside, R. I.

Alvin F. Rieck, Dept. of Biology, Marquette University, Milwaukee, Wis.

Virginia Brennan, Dept. of Zoology & Physiology, University of Illinois, Urbana, Ill.

R. B. Johnson, Dept. of Biology, University of New Mexico, Albuquerque, New Mex.

Armstrong M. Dowell, Jr., Dept. of Zoology, University of California, Los Angeles, Calif.

Irwin L. Baird, Dept. of Zoology, University of Kansas, Lawrence, Kan.

W. H. Jones-Burdick, Dept. of Biology, University of Colorado, Boulder, Colo.

Robert P. Baker, 722 Sunset View Dr. S., Akron 2, O.

Scott Adler, 419 N. Maple, Albuquerque, New Mex.

James H. Leech, 2005 Whites, Austin, Tex.

Sonja M. Korn, 4511 Hill Ave., New York 66, N. Y.

Jon L. Herring, Dept. of Biology, University of Florida, Gainesville, Fla.

Wilma B. Bias, Dept. of Zoology, University of Oklahoma, Norman, Okla.

Robert V. Parks, Dept. of Botany, Montana State University, Missoula, Mont.

Anna Ruth Brummett, Jobelle Holcombe Hall, Fayetteville, Ark.

Donald B. Doan, Jr., R.R. No. 1, Oxford, O.

Larry J. Gordon, 200 N. Maple, Albuquerque, New M.

Erwine Hall Stewart, Mesa, Colo.

Anselm M. Keefe, St. Norbert College, West De Pere, Wis.

K. F. Lagler, Dept. of Zoology, University of Michigan, Ann Arbor, Mich.

A. I. Ortenburger, Dept. of Zoology, University of Oklahoma, Norman, Okla.

E. F. Castetter, Dept. of Biology, University of New Mexico, Albuquerque, New Mex.

Mrs. Ellen Castetter, Dept. of Biology, University of New Mexico, Albuquerque, New M.

Stuart Northrop, Dept. of Geology, University of New Mexico, Albuquerque, New M.

C. Clayton Hoff, Dept. of Biology, University of New Mexico, Albuquerque, New M.

Mrs. C. Clayton Hoff, Dept. of Biology, University of New Mexico, Albuquerque, New M.

Myrtle Gruenfield, State Public Health Lab., Albuquerque, New M.

Mrs. Rebecca M. Frank, 2205 N. Broadway, Albuquerque, New M.

Sarah Louise Cook, Albuquerque High School, Albuquerque, New M.

Mrs. Howard J. Dittmer, Public School System, Albuquerque, New M.

Howard J. Dittmer, Biology Dept., University of New Mexico, Albuquerque, New M.

Mrs. Martin W. Fleck, Biology Dept., University of New M., Albuquerque, New M.

M. W. Fleck, Biology Dept., University of New Mexico, Albuquerque, New M.

Kenneth M. Walker, Oregon State College Museum of Natural History, Corvallis, Ore.

Elizabeth Mathay, Dept. Anatomy, University of Washington, Seattle 5, Wash.

Norman L. Anderson, Dept. of Zoology & Entomology, Montana State College, Bozeman, Mont.

Lester M. J. Freedman, M.D., 705 S. Braddock Ave., Pittsburgh 21, Pa.

James M. Freedman, 705 S. Braddock Ave., Pittsburgh 21, Pa.

Edwin L. Carter, 149 S. Wade Ave., Washington, Pa.

William C. Guest, 1132 Briar Cliff, Atlanta, Ga.

Earl W. Smart, Dept. of Zoology, University of Utah, Salt Lake City, Utah.

William T. Kaster, Dept. of Biology, University of New Mexico, Albuquerque, New M.

Mrs. Lela Reity Kaster, 917 N. Vassar, Albuquerque, New M.

Tema Shults Clare, 971 W. 30th St., Los Angeles, Calif.

Wilbur L. Brandt, 1832 S. Westmoreland Ave., Los Angeles 6, Calif.

Marvin G. Brotherton, 23-C College Courts, Stillwater, Okla.

Following the dinner, Mr. I. L. Baird, delegate from Kappa Chapter, University of Kansas, made the presentation of a desk set to Dr. Ortenburger. Dr. Ortenburger next introduced Dr. Stuart Northrop, Head of the Department of Geology, who gave a very interesting presentation of the geology of New Mexico. Dr. Northrop traced the geological history of the State, pointing out many physiographic pecularities of the various areas, some of which the delegates had had a chance to see during their tour to Santa Fe and back.

Following Dr. Northrop's talk, Dr. C. Clayton Hoff gave an equally interesting discussion of the biota of New Mexico, illustrating it with colored slides. These two talks were so well correlated that they practically dovetailed and the members of the Phi Sigma party were unanimous in their praises of this departure from previous banquet traditions. Everyone of the delegates went away with a much better idea of the biological and geological history of this very interesting state.

Following the two dinner addresses came the most unusual part of the whole Convention. Through the kind offices of Alpha Nu Chapter Officers, a large party of young people from a nearby Indian school presented a series of characteristic Indian dances which are seldom seen outside of the various tribal pueblos from which the young people came. The program opened with two Navaho presentations, a feather dance by a boy and a girl and a war dance by a group of men. This was followed by two girls presenting Hopi butterfly dances. Then came the buffalo dance of the Acoma Tribe presented by two boys and a girl. Next there was the Laguna version of the butterfly dance presented by a boy and a girl. This was followed by the solo corn dance of the Hopi people. Five Navaho boys followed in a presentation of the Yebachi dance. The program closed with a very intricate and unusual hoop dance performed by a young man from Taos. And so ended perhaps the most unusual, effective and instructive of all the meetings of the Phi Sigma Society.

The general arrangements for the meeting could hardly be improved upon. Male delegates were housed in one group of dormitories; female guests in another. All meals, with the exception of the banquet and the luncheon in Santa Fe, were eaten in the University Commons which were especially opened during the Christmas holidays for our benefit. The weather which had been rather unpredictable up to that time,—and since,—could not have been better, the days being sunny and warm, the evenings clear and snappy. The whole meeting owes its success to the fine hospitality of Dr. Popejoy and the authorities of the University of New Mexico, as they were carried out in the very meticulous arrangements made by the Biology Department and Alpha Nu Chapter for the comfort and entertainment of the guests from the twenty-seven chapters from all over the United States and Mexico.

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Science Is Needed in Liberal Arts Program

The requirement for the acquisition of basic, well-integrated scientific knowledge is such in this era that a liberal arts program must include a suitable background in both the physical and biological sciences. The objectives of this science program are such that no longer are the few, separate, specialized courses in each departmental area of the present college or university organization entirely adequate. The means now recommended to meet such objectives is by core courses in the physical sciences and the biological sciences or a combined general science course. Such core courses do not seem to fit the present departmentalized college or university organization and may require that administrators consider reorganization of their colleges to give better integration not only with the core course in science but with core courses that are being developed in other areas.

The instruction problem is the most difficult one at the present time and will probably not be solved satisfactorily as long as liberal education is rigidly compartmentalized. The quality of instruction in this area and in all areas must be given serious consideration. The problem of expense is one which must be met for all areas to assure success. This brings us to the rather interesting and perhaps startling conclusion that a satisfactory solution of the problem involved in teaching a required course in science may also improve the teaching in the other courses in science and it may stimulate the professors in other areas to "pluck the beams out of their own eyes"!

Plans for the integration of learning areas are some of the very interesting and challenging developments of the present era of education. I believe the attending problems can be solved satisfactorily.—Professor Alfred B. Garret (Ohio State University) in an address before The Association of American Colleges.

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CHAPTER OFFICERS AND NOTES

BETA

—University of Michigan

President—H. Lewis Batts, Department of Zoology, University of Michigan, Ann Arbor, Michigan.

Vice-President—George W. Beyers, Museum of Zoology, University of Michigan.

Recording Secretary—Charles C. Carpenter, Department of Zoology, University of Michigan,

Corresponding Secretary—Barbara L. Bowen, Department of Botany, University of Michigan.

Treasurer—Herndon G. Dowling, Jr., Department of Zoology, University of Michigan.

Chapter Editor—Arnold H. Fieldsteel, Department of Bacteriology, University of Michigan.

During the past school year the Chapter has held monthly meetings during which topics of interest to the membership were presented. Dr. M. H. Erickson, Director of Psychiatric Research and Training at Eloise Hospital in Detroit gave an excellent talk on experimental and clinical hypnosis. This was accompanied by a demonstration of hypnosis which illustrated its vast possibilities in the field of psychiatry. Recently we have had talks on such subjects as fossil hunting on the high plans by Dr. Claude W. Hibbard, explorations in the American arctic by C. O. Handley, Jr. All of our programs have been concluded by a get-together of the membership at which refreshments were served.

At the January meeting sixty-three new members representing the Departments of Bacteriology, Botany, Forestry, Paleontology, Psychology and Zoology were elected. On February 7, the following new members were elected: Emile T. Abdel-Malek, Mortimer H. Applezweig, Margaret M. Arase, Stanley Barban, Grace E. Blanchard, Virginia S. Bryan, Robert E. Chamberlain, Brooks D. Church, Catherine A. Cole, David R. Cook, Haskell R. Copelin, Barbara Dewey, Victor H. Dietz, John A. Dorr, James E. Duras, Mason G. Fenwick, Glen D. Garman, Murray A. Glanzer, Daniel L. Grosser, Albert A. Grover, Carl W. Hallberg, Harold W. Harry, Frank W. Hawthorne, William E. Hazen, Miles E. Hench, George S. Hunt, Henry A. Imshaug, Harold C. Jordahl, Louis H. Jordal, Fae B. Kaufman, Leo F. Koch, Donald C. Krause, Orley Thomas Law, Vianney Legendre, William H. Littlewood, Su-Ying Liu, Petronila C. Marasigan, Dolores D. Marsik, Margaret E. Martin, George E. Maskeny, Leonard A. Mika, Jerome S. Miller, Elaine C. Pierson, Karl E. Pottharst, William O. Pruitt, Prahlad Rajam, Merwin F. Read, Benjamin R. Roach, Donna N. Schumann, Elliot S. Sjoberg, John V. Slater, Seibert S. Sproull, Helen I. Szilli, William A. Tompkins, Harrison B. Tordorff, Henry Van Dyke, Bruce W. von Zellen, Mary C. Walsh, Donald R. Watson, Walter H. Wheeler, John E. Williams, Israel Woronoff and Wilbert J. McKeachie (faculty).

Dr. Henry van der Schalie, National Secretary of Phi Sigma was to have given a speech of welcome to the new members. Unfortunately, however, he was ill and his speech which dealt with the aims, ideals and activities of Phi Sigma was ably presented by Dr. Karl F. Lagler our Vice-Chancellor. Our future plans call for a continuation of the monthly meetings, with presentation of varied programs intended to familiarize the members with some aspects of as many of the biological sciences as possible.

EPSILON

—University of Denver

President—Charles L. Jarboe, 1914 South Monroe, Denver, Colorado.

Vice-President—

Secretary-Treasurer—Jack H. Stimpfling, 950 Navajo St., Denver 4, Colorado.

Faculty Sponsors—Dr. and Mrs. Frederick Zeiner, 1417 So. Elizabeth St., Denver, Colorado.

ZETA

—University of Wisconsin

President—Robert W. Earhart, Agronomy Department, University of Wisconsin, Madison, Wisconsin.

Vice-President—Donald C. Mortimer, Biochemistry Department, University of Wisconsin.

Recording Secretary—Peter K. Nelson, Botany Department, University of Wisconsin.

Corresponding Secretary—Ruth L. Hine, Zoology Department, University of Wisconsin.

Treasurer—Arnold M. Dean, Soils Department, University of Wisconsin.

Dr. C. A. Elvehjem, Dean of the Graduate School and head of the Department of Biochemistry, addressed an open meeting of Zeta Chapter on February 24. In his address on "The Role of the Graduate Student in the Research Program of the University," Dr. Elvehjem traced the collateral development of University research and the Graduate School, pointing out that Graduate students were a fundamental part of the research system which permits the carrying out of wide-scale organized research projects. The utilization of Graduate students in this manner gives the student an opportunity of participating in a wider range of research activities than could be afforded by his individual research work toward his degree. The benefits derived from such a system are numerous, the most obvious being a wider research background for the student and an enlarged research program for the University. In addition, Dr. Elvehjem indicated the various placements of Ph. D's in the United States in industry, government, and universities.

ETA

—University of Akron

President—Mr. Billie G. Meese, 85 E. Brookside Avenue, Akron 1, Ohio.

Vice-President—Mrs. Elinor McQuay, 127 Roger Avenue, Barberton, Ohio.

Secretary—Miss Nina Mamay, 614 Whitney Avenue, Akron 6, Ohio.

Treasurer—Mr. Robert P. Baker, 722 Sunset View Drive, S., Akron 2, Ohio.

KAPPA

—University of Kansas

President—Arthur Chapman, 101B Haworth Hall, University of Kansas, Lawrence, Kansas.

Vice-President—Fred Truxal, 326 Snow Hall, University of Kansas.

Secretary—Dorothy Taft, 411 Snow Hall, University of Kansas.

Treasurer—Charles Smith, 216 Snow Hall, University of Kansas.

Faculty Adviser—Mrs. Ruth McNair, 307 Snow Hall, University of Kansas.

Council Representative—Irwin Baird, 117 Snow Hall, Zoology Department, University of Kansas.

Alternate—Luther Buchele, 500 Snow Hall, Bacteriology Department, University of Kansas.

The following were initiated 7 December 1948: William Evans, Lowell Hager, James Mauldin, Victor Von Riesen, Keith Bowman, Phara Rathbun, Roy Peterson, James Winblad, Thomas Batty, Gerome Grunt, Jack Lungstrum, Leonard Koger, Otis King, Philip Krutzsch, Robert Hankins, John White, Cecil Goble, Charles Keys, Irving Johnson, Richard Loomis, Lucien Reynaud, Howard Brown, C. W. Sibley (faculty), Wendell Showalter, Lee Volle, Ivan Shields, Margaret Brewster, Robert Oberhelman, Philip Humfeldt, Wallace Good, Irene Watkins, David Sullivan.

LAMBDA

—Montana State University

President—Charles D. Haynes, Jr., Department of Zoology, Montana State University, Missoula, Montana.

Vice-President—John Weber, 909½ E. Beckwith, Missoula, Montana.

Secretary-Treasurer—Robert V. Parke, 110 Gerald, Missoula, Montana.

Corresponding Secretary—Robert Damon, Jumbo Hall, Montana State University.

Council Representatives—Dr. L. G. Browman, 664 South 6th Street, E., Missoula, Montana; Dr. R. A. Diettert, 155 Mount Avenue, Missoula, Montana.

NU

—Washington and Jefferson College

President—Edwin Carter, 149 S. Wade Avenue, Washington, Pennsylvania.

Vice-President—Resigned.

Secretary—Charles C. Wunder, 156 S. Lincoln Street, Washington, Pennsylvania.

Treasurer—Harold Parks, 154-D Forrest Avenue, Washington, Pennsylvania.

On Friday, December 10, Dr. Albert Martin, geneticist from Mount Mercy College and the University of Pittsburgh, was guest speaker before Nu Chapter. He has investigated the genetical differences in the parasitic wasp, Babrobracon, as found in different parts of this country. The topic of Dr. Martin's address was "Speciation." He compared the taxonomic and genetic methods for determining species, pointing out that classification into a given species is arbitrary and fluxuating with no definite line where one species stops and another begins.

The Chapter has received addresses by several of its members throughout the year: On October 7th Charles Wunder spoke on the Marine Biological Laboratory at Woods Hole; on October 28th Malcolm Rosenbaum discussed The Kinsey Report; on November 11th Harold Parks spoke on "The Organization of an Army Hospital," and Richard Van Nufflin addressed the Chapter on the subject "Conquerors of Yellow Fever."

Initiation of new members is anticipated early this semester.

PI CHAPTER

—Emory University

President—Branch Howe, Jr., 414 W. Ponce de Leon Avenue, Decatur, Georgia.

Vice-President—Richard T. Ross, A.T.O. House, Emory University, Georgia.

Secretary—Claude T. Adams, Box 268, Emory University.

Treasurer—Robert E. Gordon, 887 Forrest Road, N.E., Atlanta, Georgia.

The members of Pi Chapter were saddened on November 7, 1948, in the sudden and unexpected passing of Dr. Robert C. Rhodes, who founded our Chapter on Jan. 3, 1925. Dr. Rhodes had also been the organizer and director of the Department of Biology at Emory.

In our first meeting of the Fall Quarter, student member Charles H. Wharton, presented a lecture and movies on several Western National Parks. Mr. Wharton achieved a zoological triumph two years ago, in bringing to the United States a collection of rare animals from the Philippines. At a subsequent meeting, Dr. Eugene P. Odum, of the University of Georgia, presented some of the ecological problems of our North Georgia mountain regions. At our latest meeting, William C. Guest gave a report on the recent National Convention, which he attended as our delegate.

Our Chapter is sponsoring the departmental seminar at least once a quarter, the subject being "Professional Outlets of Biology." In these seminars, outside speakers prominent in various biological fields present the employment opportunities available in their own and related fields.

On December 8, 1948, twenty-nine new members were initiated into Pi Chapter. They are: Dr. Robert B. Platt (faculty member), Betsy Baker, Anne Boller, M. T. Boynton, Tom Buttram, Albert Creed, June Davis, Tom Galt, Martha Goddard, Kathleen Haff, George Hartley, David Hubbard, Alan Humphries, Jean Jackson, Henrietta Johnson, John Jordan, Tom Leland, Patricia McGowan, George McLean, Ed Mallory, Jack Odom, Jean Osborn, Vivienne Patterson, Rayburn Phillips, Dot Guillian, John Ramsey, Miriam Steele, Dick Thomson, Charles Wright.

RHO CHAPTER

—University of Illinois

President—Edward W. Daniels, Protozoology Department, University of Illinois, Urbana, Illinois.

Vice-President—Frank Hasbrouck, Entomology Department, University of Illinois.

Secretary—John E. Porter, Economic Entomology Department, University of Illinois.

Treasurer—Clifford C. Roan, Entomology Department University of Illinois.

Perhaps the most outstanding program, at least one of the most outstanding, had to do with "Trends in Human Biology." This was a panel discussion. Each speaker outlined his field by an introductory talk lasting about 15 minutes. The three lecturers then discussed the general problem of human biological trends. Dr. Prosser presented the physiological viewpoint, Dr. Cattell the psychological, and Dr. DeTurk the more practical limitations of world productive powers from the standpoint of Agronomy.

A second very interesting lecture was given by Dr. H. J. Van Cleave, Research Professor in Zoology, on "Modern and Ancient Indians of the Southwest." Dr. Van Cleave used excellent colored slides to illustrate his talk.

SIGMA

—University of Florida

President—Jon L. Herring, Department of Biology, University of Florida, Gainesville, Florida.

Vice-President—S. Kendrick Eshleman, Department of Biology, University of Florida.

Secretary—Ernest D. McRae, Jr., Department of Biology, University of Florida.

Treasurer—George K. Reid, Jr., Department of Biology, University of Florida.

Faculty Adviser—H. K. Wallace, Ph. D., Department of Biology, University of Florida.

Council Representative—Jon L. Herring, Department of Biology, University of Florida.

UPSILON

—Miami University

President—Belva Laughlin, Wells Hall, Miami University, Oxford, Ohio.

Recording Secretary—Owen Larrison, Miami University.

Corresponding Secretary—Marilyn Miller, 224 Hamilton Hall, Miami University.

Editor—James Chowning, Miami University.

Initiation of the Upsilon Chapter of Phi Sigma was held on December 2 with the annual banquet following it. After an enjoyable time singing many of the biological songs, our speaker, Dr. E. T. Bodenburg from Wittenberg College, Springfield, Ohio, presented and interesting program. His subject was "Our Great Outdoor Museums—The U. S. National Parks." He accompanied his speech with beautiful colored slides from many sections of the country where he has worked. One and all enjoyed traveling with him to the beauty spots of America.

Our initiates were: Robert E. Conway, William J. Cook, Hugh J. Forthman, Richard S. Hauser, Dale D. Hubbard, Robert B. Huber, Owen P. Larrison, Mary Ann Maple, David McKell, Max I. Michiels, Jack W. Newton, Granville A. Nolan, John K. Rieves, Marion W. Riggs, James E. Shideler, Harold L. Unger, Joseph T. Velardo, Kenneth A. Wilson, Mary Kay Wright.

PHI

—University of New Hampshire

President—Charles McLaughlin, Forestry Building, University of New Hampshire, Durham, New Hampshire.

Vice-President—Richard Kerwin, Theta Chi House, University of New Hampshire.

Recording Secretary—Lois Milbury, Scott Hall, University of New Hampshire.

Corresponding Secretary—Leonard P. Wolfe, Jr., Nesmith Hall, University of New Hampshire.

Council Representative—Dr. C. F. Jackson, Nesmith Hall, University of New Hampshire.

Phi Chapter of Phi Sigma has spent many meetings changing over our constitution. It was found that many parts were a bit out of date and something had to be done about this. We found that in changing over one part it set off a chain of reactions that meant other changes. This being finally completed, we settled down to the business of the year.

Just before the Christmas vacation Phi Chapter held its annual Christmas party. Again it was at Prof Jackson's house. The program started off with all the new pledges being introduced to everyone, themselves included. After this the house opened up its arms and the party really got under way. Joseph Lamy acted as Santa and did an excellent job. The gifts had been limited to twenty-five cents and they were to be jokes so you can imagine what some of them were—smoked herring to the Forestry Prof, hair curlers to a member with a perpetual sniffle, sun tan oil for a bald head, etc. A very good time was had by all, especially the pledges who did not expect that serious people could really let loose. A remark was heard coming from a pledge as the party broke up—"Boy, can they let their hair down."

After Christmas vacation we completed the initiation of new members and then lined up a series of programs for the rest of the year.

On the 12th of January Dr. Margery Milne of the Zoology Department gave a very interested, illustrated talk on various biological stations in the United States. Her pictures were all in color and had been taken either by herself or by Dr. Lorus Milne, her husband.

On the 16th of February Dr. Charlotte Nast of the Botany Department gave a talk on the "Structure of Cambium and Xylem of Woody Plants." Along with the help of excellent slides of woody tissues she explained that setting up an evolutionary line in plants that we should consider more than just the flowers. The evolution of tracheids to fibers, parenchyma, and seive-tubes is a very important factor to take into account.

At the present time there is some discussion resulting from a communication from Alpha Xi Chapter of Rhode Island State College. It is being suggested that we, being the only two active Chapters in New England, should get together on outings, etc. Dates are being discussed and the general feeling among Phi Chapter members is "the sooner the better."

Among the new members to our Zoology Department, these were found to be members of Phi Sigma: Dr. Jean Allen, Upsilon Chapter, Miami University; Dr. Wilbur Bullock, Rho Chapter, University of Illinois; Dr. Margery Milne, Alpha Kappa Chapter, Hunter College.

The new members of Phi Chapter Phi Sigma are as follows: Jacqueline Bean, Frances Benedict, Roberto Cox, Roger Davidheiser, Richard Dobson, Richard Falilman, Francis Fay, Edward Godfrey, Albert Haley, Jean Higgins, Charles Jack, Stanley Krochmal, Dr. Charlotte Nast, Marion Quimby, Virginia Quinn, Arlene Roy, Philip St. John, Jane Shaw, Lawrence Staples, Helen Willand, Harrison Wilson.

CHI

—Montana State College

President—Norman Anderson, Route 4, Bozeman, Montana.

Vice-President—Doris Humphrey, 204 South Third St., Bozeman, Montana.

Secretary—Charles A. Purkett, 522 West Main St., Bozeman, Montana.

Treasurer—Jean Dorset, Quad F, Montana State College, Bozeman, Montana.

Publicity Chairman—William M. Fry, Montana State College.

On December 10, 1948, seven pledges were initiated into the Chi Chapter of Phi Sigma Society. Prior to initiation, all pledges were required to get the signatures of all active members on a fresh egg and also to prepare a pseudo-scientific paper. Following initiation an informal cafeteria style dinner was held in the student union dining room in honor of the new initiates.

Chi Chapter's faculty advisors for this year are Dr. W. E. Booth and Mr. C. V. Davis.

Norman Anderson, our representative to the recent national conclave, has reported many interesting occurrences of the meeting.

The new members are Michael Britton, Earl Douglas, Peggy Fisher, Lowell Johnson, Joseph Kathrein, John Miller, and Lloyd Yonce.

PSI

—University of Washington

President—Quentin N. Myrvik, Department of Microbiology, University of Washington, Seattle 5, Washington.

Vice-President—Richard Kerr, 5011 17th Avenue, NE, Seattle 5, Washington.

Treasurer—Julius Rockwell, 3904 University Way, Seattle 5, Washington.

Secretary—Elizabeth D. Mathay, Route 3, Box 3517, Edmonds, Washington.

Faculty Advisor—Dr. Melville Hatch, Department of Zoology, University of Washington.

At the last Spring meeting the Psi Chapter presented the Phi Sigma Medal for 1948 to George M. Haliburton, a graduating senior in the College of Forestry.

The speaker at the 28 October meeting, Dr. Lauren R. Donaldson, Assistant Professor of Fisheries on the campus, presented some of his colored movies taken last summer with the group of scientists doing atomic research in the Pacific Atolls.

On 2 December 1948 Dr. Robinow discussed cytology of bacteria. Dr. Robinow, a prominent Walker-Ames lecturer, is noted for his technique and theories concerning nucleus in bacteria.

The initiates of 4 March 1948 meeting were: John W. Allen, Domonic P. Ambrosio, Frederic B. Baker, Donald E. Barry, Harry H. Bartels, Dolores (Yvonne) Bobb, Charles M. Chambers, Jr., Velma C. Chambers, Vaughn V. Chapman, Donald H. Clark, Joe W. Clark, Prabhakar R. Deshpande, Dexter M. Easton, Harvey D. Erickson, Fredrick F. Ferguson, Philip G. Haddock, Regina L. Herrmann, Roy C. Horne, Walter G. Hughes, Ranga Iyengar, Ernest R. Jeffries, Richard C. Kennedy, Richard George Kerr, Patricia F. Knight, Swei-yen Koo, Wilbur J. Linde, Elizabeth D. Mathay, Zella V. McMannama, Quentin N. Myrvik, Arnold C. Neva, James H. Nishitani, Bernard L. Orell, Rudolph A. Perry, Erick N. Peterson, Lloyd E. Powell, John A. Putnam, Julius Rockwell, Jr., Donald P. Schmidt, Bill M. Shimada, Anders E. Sola, Olav M. Sola, Hung T. Tu, Harry D. Van Meter, Donald G. Watson, Sigurd J. Westrheim, Arthur H. Whiteley.

OMEGA

—University of Oklahoma

President—Jane Ann Bullock, Newman Hall, University of Oklahoma, Norman Oklahoma.

Vice-President—Edmund Gleason, 825 W. Symnes, Norman, Oklahoma.

Secretary—Genevieve Dale, 440 College Avenue, Norman, Oklahoma.

Treasurer—Wilma Bias, Box 960, Wilson Center, Norman, Oklahoma.

At a meeting to be held February 23, Omega Chapter will choose various committees to plan future meetings, spring initiation, and election or appointment of someone to take care of news for THE BIOLOGIST.

We had an initiation on February 8 and the following people were initiated: Elizabeth Taft, Mary Smith, Sammie Potter, H. K. Bailey, Russell Faulkner, Jerome Frankel, Frank Mock, Knox Harrell, Don Boyer, Margaret Anderson, Robert McCarver, Harold Dundee, Ed Ries, Joan F. Snodgrass, T. G. Shanos, Mayo Martin, Stanley Coppock, Bill Brock, Fred Heinzig, Andre Weitzenhoffer, Joella Campbell, Bill Crittenden, and Howard Goldman.

ALPHA ALPHA

—University of Southern California

President—Wilbur L. Brandt, Box 109, University of Southern California, Los Angeles 7, California.

Vice-President—Leroy William King, Box 109, University of Southern California.

Recording Secretary—Mary Glyde Marsh, Box 109, University of Southern California.

Corresponding Secretary—Beverly Heller, Box 109, University of Southern California.

Treasurer—Howard Arthur Winter, Box 109, University of Southern California.

Faculty Advisor and Council Representative—Mrs. Tema Shults Clare, Box 109, University of Southern California.

An initiation dinner meeting was held by our Chapter last Spring. Special honor was given to Dr. Bruce Harrison, Zoology Department Head, who was retiring from office. Dr. R. C. Osburn, Research Associate of the Allan Hancock Foundation gave a lecture on the development of teeth.

Mr. Wilbur Brandt is the program chairman for the coming year. At the first meeting of the semester, Dr. Frederick F. Shelden, of the Zoology Department, spoke on "Visual Problems in Night Flying." On December 10th Mr. Robert S. Fairchild of the Botany Department will be the speaker. His subject will be "Plant Breeding Systems."

The following are the fifteen initiates taken into the Chapter on 14 May 1948: Isabel Dimmick (Bacteriology), 952 W. 37th Street, Los Angeles 7, California; Noel L. Freeman (Parasitology), 115 6th Street, Seal Beach, California; Leslie A. Gage (Zoology), 811 N. Heliotrope Drive, Los Angeles 27, California; Beverly Heller (Botany), 71 E. End Avenue, New York 28, New York; Ted M. Lerman (Zoology), 1093 Salem Road, Union, New Jersey; Mary Glyde Marsh (Zoology), 4701 Wallingford Street, Pittsburgh 13, Pennsylvania; Walter Edwin Martin (Parasitology), 5429 Alviso Avenue, Los Angeles 43, California; Robert M. Newhouse (Zoology), 309 E. Stocker Street, Glendale 7, California; Thomas Parker (Biochemistry), 3512 S. Norton Avenue, Los Angeles 16, California; Lionel Roetter (Bacteriology), 548 S. Soto Street, Los Angeles 33, California; Anna N. Scherer (Botany), 1663 W. 11 Place, Los Angeles 15, California; John H. Silliker (Bacteriology), 733 N. Edgemont Street, Hollywood 27, California; Wayne L. Simmonds (Medical Bacteriology), 731 W. 157 Street, Gardena, California; Albert W. Stembridge (Biology), 1434 West 93 Street, Los Angeles 44, California; Philip Yankowitz (Zoology), 6248 Warner Drive, Los Angeles 36, California.

ALPHA BETA

—Mount Union College

President — Jack Barnard, 3412 11th Street, S.W., Canton, Ohio.

Vice-President — Doris Luginbuhl, 115 S. Park Avenue, Alliance, Ohio.

Secretary—Thelma Hill, Route 1, Richmond, Ohio.

Treasurer—Jack Shanewise, 1663 17th Street, Cuyahoga Falls, Ohio.

Chapter Editor—Sue Everhard, Elliott Hall, Mount Union College, Alliance, Ohio.

Faculty Advisers—Dr. A. V. Hunninen and Prof. O. H. Engle.

Council Representative — Prof. O. H. Engle.

The list of new initiates is as follows: Paul Aldenderfer, Mary Bennett, Thomas Dunstan, Daniel Kibler, Dorothy Morris, Robert Phillips, Pauline Rankin, Robert Ritchie, John Wagner.

ALPHA EPSILON

—University of Pittsburgh

President — Martin A. Yavorsky, 327 Craft Avenue, Pittsburgh 13, Pennsylvania.

Vice-President—Mima Milliron, Arlington Apts., 515 S. Aiken Avenue, Pittsburgh, Pennsylvania.

Corresponding Secretary — Irene M. Boccella, 6107 Alder Street, Pittsburgh 6, Pennsylvania.

Recording Secretary — Mrs. Jerome Schiff, 340 Craft Avenue, Pittsburgh 13, Pennsylvania.

Treasurer—Richard T. Hartman, 931 St. James Street, Pittsburgh 6, Pennsylvania.

Former Dean of the School of Pharmacy, Dr. Leasure Kline Darbaker, teacher of pharmacognosy, bacteriology and microscopy at the University of Pittsburgh since 1906, died suddenly February 13th at his home in Pittsburgh of a heart attack. A son of the late Reverend Dr. Henry D. and Agnes Kline Darbaker, he was born in Pittsburgh, and he was educated at Grove City College, Ohio Northern University, and the Universities of Pittsburgh, Berlin and Edinburgh. He wrote many articles and several manuals on the subjects with which he was so familiar. Dr. Darbaker was a charter member of Phi Sigma Society Alpha Epsilon Chapter and many other similar organizations.

The Schenley Park Nature Museum resounded with the measured rhythm of dancing feet to the accompaniment of the caller's clear steady voice. The occasion for such frivolity among the "Alpha Epsilonites" of the Phi Sigma Society was a combined box social and square dance, held on Tuesday evening, 8 February 1949. Despite the inexperience of most of the members and their guests, they soon proved to be quite adept at mastering the fundamentals of the art of square dancing. The highly decorative lunch boxes were the result of the painstaking efforts of the lassies who furnished the refreshments. Small wonder the box lunches were so easily auctioned off to the men by the capable Dr. Kay of Carnegie Museum who acted as auctioneer. To add to the enjoyment of the evening, Dr. L. Freedman showed his very excellent movies of Albuquerque, New Mexico, the site of the last National Convention, at which he was Chapter Delegate. It was well agreed by all that the evening could not have been more enjoyable. Mrs. Leroy Black, who served as Chairman, was congratulated for the success of the occasion.

ALPHA ETA
—Oklahoma Agricultural and Mechanical College

President—Dallas F. Wadsworth, Botany Department, Oklahoma Agricultural and Mechanical College, Stillwater, Oklahoma.

Vice-President — Joe W. Smith, 201 Duck, Stillwater, Oklahoma.

Secretary—Elizabeth Darby, 250 Willard, Stillwater, Oklahoma.

Treasurer—Joe M. Dixon, Box 491, Veterans Village, Stillwater, Oklahoma.

The following were initiated into Alpha Eta Chapter on Sunday afternoon, 19 December 1948: James Baker, Frank Benton, Robin Blackburn, Leonard Carpenter, Thomas Cox, Elizabeth Darby, Lester Davis, Stuart Evans, Donald Fourier, James Gardenhire, Arthur Goldstein, Dan Guyer, Hunter Hancock, William Harris, Charles Holden, Grady Howard, Eugene Hsi, Harold Kidd, Lee Roy Larkin, Billy Joe Ott, Hugh Payne, Perry Robinson and Paul White.

ALPHA IOTA
—Bucknell University

President—Robert Batten, Tau Kappa Epsilon, Bucknell University, Lewisburg, Pennsylvania.

Vice-President — Bowdoin Berninger, 1132 Reagen Street, Sunbury, Pennsylvania.

Secretary-Treasurer — Jack Wolansky, Sigma Alpha Mu, Bucknell University.

Due to an unusually large number of seniors graduated last June, the total active membership of Alpha Iota Chapter at the beginning of the fall semester was three. Since that time, however, twenty-three eligible students have been pledged. The start of a new semester will make aproximately ten additional students eligible for pledging. A large initiation and banquet will probably be held sometime in May for those pledging now. On 26 January, the following were initiated into active membership: Eileen M. Berger, Grace M. Fischer, William A. Stark, Glentworth Lamb.

ALPHA KAPPA
—Hunter College

President—Barbara M. Orski, 31-71 45th Street, Long Island City, New York.

Vice-President—Erica Joshue, 245 Fort Washington Avenue, New York, New York.

Secretary-Treasurer — Helen Kangos, 269 Audubon Avenue, New York 33, New York.

Council Representative—Rose A. Grandinetti, 600 W. 168th Street, New York 32, New York.

Chapter Editor—Marthe Dresner, 322 West 72nd, New York 23, New York.

At a business meeting on February 8th, Miss Sonja M. Korn, our Delegate to the National Convention, reported on that meeting. At the same meeting plans were made to publicize Phi Sigma in the hope of starting new chapters among the many other colleges and universities in New York.

In cooperation with the Hunter College Biology Department we are starting a project of testing the numerous *Drusophila* salivary gland chromosome stains, with a view of preparing a permanent slide collection for the college.

Beside planning to have several speakers during the term, we expect to attend as a group some of the many scientific meetings being constantly held in New York. We are fortunate in this way to be able to attend the lectures of the American Museum of Natural History, the New York Academy of Science, the New York and Brooklyn Botanical Gardens and many other local scientific organizations.

The following new members were initiated into Alpha Kappa Chapter on the evening of December 23rd at the Barbizon Hotel; the initiation, the first to include men, was followed by a banquet: Helen Scheftel Axelrod, Ruth Dittmar, Mary Ehrlich, Patricia Faber, Bernard Friedman, Sarah Katz, Rachel Klonymus, Esther Levenson, Estelle Levine, Gerald Levy, Bernice Regenbogen, Hilda Weyl, Phillip Wiener.

ALPHA LAMBDA

—University of Utah

President—John C. Downey, 442 University Street, Salt Lake City, Utah.

Vice-President — Earl W. Smart, 1539 Kappa Avenue, Apt. 2, Stadium Village, Salt Lake City, Utah.

Recording Secretary—Betty E. Gunderson, 1753 Harvard Avenue, Salt Lake City, Utah.

Treasurer — Earnest J. Roscoe, 2000 South State, Salt Lake City, Utah.

Faculty Advisor—Dr. Don M. Rees, 427 S. 12th East, Salt Lake City, Utah.

Chapter Representative — Dr. William H. Behle, 1233 E. 8th South, Salt Lake City, Utah.

Initiates for last year received their certificates on 4 February 1948 and names were published in THE BIOLOGIST in May 1948. New members for this year have not, as yet, been chosen.

ALPHA MU

—University and State College of Oregon

President—Kenneth M. Walker, 947 N. 11th, Corvallis, Oregon.

Vice-President—Robert Sowell, Zoology Department, University and State College of Oregon, Corvallis, Oregon.

Secretary—Ida Fredell, Sigma Kappa, University and State College of Oregon.

Treasurer—Eugene P. Haydu, A-14-5 Adair Village, Corvallis, Oregon.

Faculty Adviser—Dr. C. H. Martin, 322 N. 21st, Corvallis, Oregon.

Council Representative — Kenneth M. Walker.

ALPHA NU

—University of New Mexico

President — Larry J. Gordon, 200 N. Maple, Albuquerque, New Mexico.

Vice-President—Ferd Sumrell, Varsity Village, Albuquerque, New Mexico.

Secretary-Treasurer — Diana Hinman, Biology Department, University of New Mexico, Albuquerque, New Mexico.

Publicity—Roger S. Wotkyns, Department of Biology, University of New Mexico.

ALPHA XI

—Rhode Island State College

President—Henry Bessette, Fort Kearney, Sauderstown, Rhode Island.

Vice-President—Bernice Anderson, E. R. Hall, Rhode Island State College, Kingston, Rhode Island.

Secretary—Gertrude Leacy, North Annex, R.I.S.C.

Recording Secretary—Ingrid Berglund, E. R. Hall, R.I.S.C.

Treasurer — Margaret Gilbert, Kingstown Road, Kingston, Rhode Island.

Faculty Adviser and Council Representative—Dr. Donald J. Zinn, Zoology Department, R.I.S.C.

It has been the policy of Alpha Xi to present at least one program meeting a month to which everyone is welcome. Guest lectures are usually invited from educational institutions or biological laboratories in the Southern New England region. Last semester Dr. Ernest Hartung, from our faculty gave an informative talk on "Tumors in Drosophila." At our last program meeting, Dr. Russell Bowman, from Rhode Island Hospital, lectured on "The Chemistry of the Blood." This semester our speaking program includes Dr. J. Walter Wilson of the Biology Department of Brown University. On April 6th, Dr. Kirley Mather of Harvard University will be our guest, while at our May 4th meeting the lecturer will be Mr. William Clapp of the Clapp Laboratories in Duxbury, Massachusetts. Our annual banquet is planned for May 17th, with Dr. Michael De Meo as guest speaker. Dr. De Meo was one of the founders of Alpha Xi.

The three departments are working on the projects for the regional conference to be held in April at Wheaton College. The initial step in modernizing our Chapter Contsitution was started. The committee has the rough draft to put before the club at our next business meeting.

The pledges who were formally initiated last semester are as follows: Joseph D. Barrat, William D'Aguanno, Rudolph D'Andrea, Esther Depardo, Lafayette Frederick, Mary Ann Ferrigno, William Hartnett, Dr. Ernest Hartung, Bancroft Henderson, John Hood, Robert Joy, John Kuschke, John Lowney, Mario Moretti, Leonard Mortenson, Francis Muller, William Redding, Ethel Sellers, Dr. Vladimir Shutak, Gabriel Surabian, Richard Sinnott, Mary-Garnett Tillinghast, Dorothy Toll, Leonard Weis, Jane Williams.

ALPHA OMICRON

—Marquette University

President—Alvin Rieck, 1309 W. Locust Street, Milwaukee 6, Wisconsin.

Vice-President—Howard Suzuki, 1682 N. Marshall Street, Milwaukee, Wisconsin.

Recording Secretary — Kathleen Nevins, 1012 S. 74th Street, West Allis 14, Wisconsin.

Corresponding Secretary — Mary E. Turgeon, Apt. 403, 920 E. Mason Street, Milwaukee 2, Wisconsin.

Chapter Councilor—Joseph A. Gillan, 4638 A West Medford Avenue, Milwaukee, Wisconsin.

Faculty Advisor—Dr. E. S. McDonough, 253 N. Pinecrest Avenue, Milwaukee, Wisconsin.

ALPHA PI

—University of Colorado

President — W. Harry Jones-Burdick, 704 University Avenue, Boulder, Colorado.

Vice-President—Martin W. Fleck, Biology Department, University of Colorado, Boulder, Colorado.

Recording Secretary—Ruth Ann Wolf, Biology Department, University of Colorado.

Corresponding Secretary — Patricia Bramson, Biology Department, University of Colorado.

Treasurer — David Carswell, Biology Department, University of Colorado.

Chapter Editor—Joseph Hall, Biology Department, University of Colorado.

At recent meetings we have heard Dr. Robert Pennak, of our Biology Department, speak on Evolution; Samuel Detwiller, the noted Forest Pathologist and Soil Conservationist, speak on these two problems. Following the initiation Dr. Karl Dittmer spoke on Metabolic Antagonists.

Dr. Karl Dittmer, professor of chemistry, pointed out the basis of antagonist research now being done in the University's chemical laboratory when he spoke on "Biological Aspects of Metabolic Antagonists" in the Old Main chapel last Thursday.

Dittmer, guest speaker for Phi Sigma, biology honorary, said that the research on compounds related to vitamins and amino acids is based on the fact that it is possible in many cases to synthesize these compounds.

When included in the growth medium of bacteria, the compounds act as antagonists and thus hinder the metabolism or successful growth of bacteria. The whole program points to systematic cataloging of these specific changes which can be made in the necessary compound so that a disease may be fought on a planned, scientific basis instead of blindly by the use of various compounds which may or may not work.

One of the first attempts, he said, to find an antagonist was in 1930 when cattle were dying by the hundreds from internal hemorrhages. Carl Link, biochemist, investigated this but not until 1944 was it discovered that the hemorrhages resulted from a lack of Vitamin K brought about by the interference of another compound, dicoumarol.

Using slides, Dittmer compared vitamin molecules to a key showing that their composition must have the right structure to perform their function. He then showed how vitamins combine with specific proteins to form an enzyme; he compared this to a coin in a pay telephone which successfully operates the mechanism. Then he showed how an anti-vitamin plus a specific protein will lead to a block enzyme, comparing it to a lead slug in a telephone which results in unsuccessful operation. The structures of various compounds were then flashed on the screen.

Dittmer said, "In all cases, if the compound so designed is a true antagonist, then it should be possible to add a certain amount of the metabolite to the growth medium causing the growth to return to normal, thus nullifying the toxic effects of the antagonist."

The antagonist research is under the direction of Dittmer and Irving Goodman, assistant professor of chemistry, and utilizes funds from a contract with the Office of Naval Research.

Dittmer left Friday for New York, where he will address the New York

Academy of Science on a topic related to antagonistic research.

Several movies and speakers are planned for future meetings and emphasis is being placed on informal as well as technical achievements of the Chapter members in the fields of biology.

The following persons were initiated into the Chapter on the first of February: Shirley Appleby, Dean Girard, Joseph Hall, Barbara McBrien.

ALPHA RHO

—University of Arkansas

President — Roland E. Howell, Box 1102, Veterans Village, Fayetteville, Arkansas.

Vice-President—Neil D. Fulton, Route 5, Fayetteville, Arkansas.

Secretary—Anna Ruth Brummett, Jobelle Holcomb Hall, University of Arkansas, Fayetteville, Arkansas.

Treasurer—J. R. Ott, 540 Whitham, University of Arkansas.

ALPHA SIGMA

—University of Texas

President—A. J. Rowe, Biology Building, University of Texas, Austin, Texas.

Vice-President—J. H. Leech, Biology Building, University of Texas.

Recording Secretary—J. A. Krosohewsky, Biology Building, University of Texas.

Corresponding Secretary—W. L. Evans, Biology Building, University of Texas.

Treasurer—J. Johnston, Biology Building, University of Texas.

Council Representative—Addison Lee, Botany Department, University of Texas.

Reporter — Russell Garland, Zoology Department, University of Texas.

ALPHA TAU

—National University of Mexico

President—Dr. Eusebio Davalos Hurtado, 2A Merced Gomez 32, Mixcoac, D. F., Mexico.

Vice-President—Dr. Efrain G. Pardo, Heroes de 1821 numero 20, Tacubaya, D. F., Mexico.

Treasurer—Senorita Maria Elena Caso Munoz, Ometusco 93, Mexico, D. F., Mexico.

Recording Secretary — Miss Johanna Faulhaber, Dept. de Antropologia Fisica Museo Nat'l de Antropologia, Moneda No. 13, Mexico D. F., Mexico.

Fellow member Mr. Luis Limon Gutierrez and Mr. Felipe Montemayor Garcia are preparing an important work on United States Technique in military selectivity from the psychological and physicoanthropological points of view, as the result of investigations carried out in different places of the United States, thanks to a scholarship granted them by the Secretariate of National Defense of Mexico.

We have not continued the regular conferences which we had begun during the first months after the formation of the Chapter — due to difficulty of finding new members for it; but after numerous meetings to discuss intrinsic affairs, a campaign has been undertaken to choose members interested in biological research and very soon the regular meetings of the Chapter will be resumed.

There have been elected as faculty members two of our most distinguished professors of the National School of Anthropology and History, Drs. Daniel F. Rubin de la Borbolla and Juan Comas. The Alpha Tau Chapter was invited to take part in the States' Convention of Soil and Water Conservation celebrated in Celaya, Guanajuato, Mexico, on December 17, 18 and 19. Dr. Efrain G. Pardo, Vice-President of the Chapter, and Mr. Julio Ibarra Urrea were sent as representatives of the Chapter at the Convention Phi Sigma Society celebrated in Albuquerque.

The following are the present members of the Chapter: Sr. Guillermo Anguiano Landin, Srita. Maria Elena Caso Munoz, Srita. Anne Chapman, Dr. Eusebio Davalos Hurtado, Sr. Jorge Derbez Muro, Sra. Johanna Faulhaber, Srita. Elena Gutierrez Sanchez, Sr. Carlos Guzman Flores, Sr. Raul Hernandez Peon, Srita. Ana Hoffmann Mendizabel, Sr. Julio Ibarra Urrea, Sr. Luis Limon Gutierrez, Sr. Armando Torres Michua, Sr. Felipe Montemayor Garcia, Srita. Ofelia Montemayor Martinez, Sr. Jose Negrete Martinez, Sr. Efrain G. Pardo, Sr. Raul R. Rodriguez

Srita. Maria de los Angeles Sandoval, Srita. Raquel Tello de la Pena, Sr. Lauro Jose Zavala.

ALPHA UPSILON

—University of California

President — Kenneth Norris, Zoology Department, University of California, Los Angeles 24, California.

Vice-President — Sol Kishlansky, Botany Department, University of California.

Secretary—Esther Richter, Zoology Department, University of California.

Treasurer—Shogo Yamaguchi, Botany Department, University of California.

Corresponding Secretary — Margaret Amrein (nee Brown), University of California.

Chapter Editor — Armstrong Dowell, Jr., Department of Zoology, University of California.

A monthly News Letter is being published and the first issue will be released on February 18, 1949. Also, on this date twelve new members will be initiated.

The monthly meetings are held on the first Friday evening of each month and Dr. Abraham White will be the featured speaker on April 1, 1949. Dr. White is a nationally known biochemist who will speak on some biochemical aspects of immunology (this is not a title, merely a subject).

An initiation is planned for the latter part of May and will be held at Point Dune where excellent observation of Marine Invertebrates may be held in the Tide Pools there. Swimming in the blue Pacific and a picnic will also be on the program for this initiation.

The reactivation of Mu Chapter at the University of California at Berkeley has been initiated by Alpha Upsilon and we hope that in the near future we shall be able to welcome Mu Chapter back into the fold.

ALPHA PHI

—College of Puget Sound

President—Howard R. Bowman, College of Puget Sound, Tacoma, Washington.

Vice-President—Robert H. Alexander, Route 3, Box 615, Puyallup, Washington.

Secretary — Thelma K. Gloyde, 8856 Edgewater Drive, S.W., Tacoma, Washington.

Treasurer — Dr. Murray L. Johnson, 3810 N. 35th Street, Tacoma 7, Washington.

Faculty Advisers and Sponsors—Prof. James R. Slater and Dr. Gordon D. Alcorn.

Editor—James Caillouette, College of Puget Sound.

Faculty members: Dr. Robert Sprenger, Welden Rau.

Student members: George Fairfax, Paul Gingrich, Robert Johnson, Duane Paulson.

Initiates: James Caillouette, Irene Creso, Howard Erwin, Jr., Frederick Hansen, Jr., Aldon Peterson, Harland Peterson, Doris Stewart.

Alumni: Jerry Baker, Audry Boucher, Jeanne Boucher, Glenn Brokaw, Rodney Brown, E. Ford Dicks, Lois Fassett, Norman Hawkins, Frank Jones, Edward Kitchin, James Legg, Merle Legg, Herman M. Myhrman, Obert Sovde.

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Initiation Insignia

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"The object of Phi Sigma is to promote interest in biological research. Although always designated as an honorary biological research society, it should be considered as a working guild of biologists interested in research. In effect, election to Phi Sigma should be an opportunity for better work, rather than merely election to an honorary society."

Mile Posts

1915	March 17, Alpha Chapter organized, Ohio State University, Columbus.
1916	May, Central Governing Body organized, BIOLOGIST first issued.
1917	June, last War-time BIOLOGIST issued.
1921	February, BIOLOGIST revived.
1924	December, First National Meeting, Constitution revised, Washington, D. C.
1925	December, Second National Meeting, First Science Program, Kansas City.
1926	December, Third National Meeting, Second Science Program, Philadelphia.
1927	December, Third Science Program, Nashville.
1928	December, Fourth National Meeting, Coat-of-Arms adopted, Fourth Science Program, New York.
1930	January, Council Meeting, Ritual Revised, Norman, Okla. December, Fifth National Meeting, Fifth Science Program, Cleveland.
1931	Phi Sigma Letters Registered, U. S. Patent Office.
1932	December, Sixth Science Program, Atlantic City.
1933	June, Sixth National Meeting, Seventh Science Program, Chicago.
1935	December, Seventh National Meeting, Eighth Science Program, St. Louis.
1937	December, Eighth National Meeting, Ninth Science Program, Indianapolis.
1939	December, Ninth National Meeting, Tenth Science Program, Silver Anniversary, Ohio State University, Columbus.
1941	December, Tenth National Meeting, Dallas, Texas.
1946	December, Eleventh National Meeting, Boston, Mass.
1948	December, Twelfth Meeting, Eleventh Science Program, Albuquerque, N. Mex.

The Constitution provides that: "A new active chapter may be established in any four-year degree-granting college or university . . . which is equipped with facilities for research in biological sciences to such an extent that at least one degree beyond the baccalaureate may be earned from that institution for biological research pursued there."